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An Economic Study of the Food Habits of the Ring-Necked Pheasant in South Dakota

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FOOD HABITS OF THE RING-NECKED PHEASANT

STATE OF SOUTH DAKOTA

DEPARTMENT OF

ENTOMOLOGY - ZOOLOGY

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ACKNOWLEDGMENTS

During the course of the investigation covered by this report, valuable assistance was rendered the writer by Paul Johnson who was engaged to work on this project for 12 months, and by Gerald Spawn who was employed for 5½ months. Mr. Johnson sorted the crop and gizzard contents of 274 pheasants, he identified much of this material, he counted the specimens or portions of specimens of each species of plant or animal used as food by the pheasants and he recorded the data secured. Mr. Spawn worked over the crop and gizzard contents of eleven pheasants, identified some of the food material, made the necessary counts and recorded all data connected with the eleven pheasants. In addition, he made all the graphs appearing in this bulletin and performed much other valuable work.

Mathew Fowlds of the Agronomy Department of the State College of South Dakota identified many of the seeds listed as food of the pheasant, while Emma F. Sirrine of the Bureau of Plant Industry, U. S. Department of Agriculture, identified a few doubtful seeds. N. E. Hansen of the State College of South Dakota classified a small number of fruit pits. L. L. Buchanan, Carl Heinrich and A. G. Boving, all of the Bureau of Entomology, U. S. Department of Agriculture, identified some of the doubtful species of adult Coleoptera, Lepidoptera and Hymenoptera and some of the immature stages of these orders of insects. E.M. Becton of the Ohio State University, Columbus, Ohio, H.C.Fall of Tynsboro, Mass., and H. F. Wickham of the University of Iowa, Iowa City, Iowa, each classified a few adult Coleoptera. E.P.Felt, Director and Chief Entomologist of the Bartlett Tree Research Laboratories of Stamford, Conn., determined the plant galls listed in this bulletin.

W. L. McAtee of the Bureau of Biological Survey, U. S. Department of Agriculture, made an economic classification of all the identifiable plant and animal food found in the 285 pheasant food tubes that were submitted to us for investigation. And, finally, Raymond Bushland and Fred Bingham assisted the writer in checking and rechecking the tables found in this bulletin: they also aided in proof reading, and they took care of many details too numerous to mention.

INTRODUCTION

The economic status in South Dakota of the ring-necked pheasant (Phasianus colchicus torquatus Gmelin X Phasianus colchicus colchicus L.) has turned out to be a controversial matter of no small importance with the citizenry of the State. This bird was introduced into South Dakota mainly thru the efforts and funds of the State Department of Game and Fish, and thru this department the pheasant was protected from slaughter by hunters, and permitted to multiply. * When it was believed that the pheasants had established themselves in a county and multiplied sufficiently to warrant an open season, such an open season was declared in that county, regulations being issued which permitted the shooting of male birds only and which restricted the bag limit per day and the length of the season to avoid extermination of the pheasant or too great a reduction in numbers of the birds. As the pheasants increased in numbers in other counties, open seasons were declared in these counties also. When the pheasants increased in numbers still more, the open season in some counties was lengthened, the bag limit was increased, and the absolute protection formerly given the hens was at times modified.

By following the general plan of increasing or decreasing the length of the hunting season, by making the bag limit larger or smaller, and by entirely or only partially protecting the hens, the Department of Game and Fish believes that the pheasants can be maintained in desirable numbers in any of those counties that are favorable towards maintaining a reasonably abundant pheasant population.

However, pheasants have been reported frequently as harming farm and garden crops in spite of the logical policy of the State

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* The following account of the introduction of the pheasant into South Dakota is taken from a circular prepared in 1930 by O. H. Johnson, Director of the Department of Game and Fish of South Dakota: "The pheasant hunting enjoyed in South Dakota today is the result of an investment of less than $20,000.00 in the purchase of stock. The pheasant was first introduced into our state in 1912 when about 300 birds were released by the Game Department. During 1912 and 1913 a number of birds were purchased with funds contributed by a group of sportsmen, but the real program was not started by the Department until in 1914 when some 2,000 birds were purchased. During 1915 another 2,000 birds were liberated. In 1917, 1918 and 1919 smaller purchases were made and in all approximately 7,000 birds were purchased. From this original stock, the birds have increased to such an extent that it is conservatively estimated that approximately two million birds were taken by licensed hunters during the open seasons of 1927 and 1928. Unfavorable weather conditions somewhat reduced the kill in 1929, it being estimated that about one million were taken."

Department of Game and Fish. Most of the complaints charged the pheasants with pulling up young corn, while others charged the birds with pecking out and eating planted seed corn, with pulling up small grains, with pecking out and eating planted small grain seed, with pecking out or uncovering potatoes and pecking holes in them, with pecking holes in melons and tomatoes, with pecking holes in the stalks of corn , etc., etc. Such farmers and truck growers who believe that they suffered considerable losses thru the work of pheasants upon their crops usually have decided opinions as to what should be done with this species of bird. The most extreme policy advocated to the writer was an absolute extermination of the pheasant. A second policy advocated a reduction in numbers of the pheasant to a point where the damage would be negligible. A third group of farmers and truckers insisted that while the pheasant does some harm, the good that is done by the birds balances, or more than balances, the harm and, therefore, the birds under ordinary circumstances should be protected.

On the other hand, it is undoubtedly true that most of our farmers and truck growers have experienced no direct losses because of the presence of the pheasant in the State and such farmers may be ardent supporters of the law protecting the birds, they may feel indifferent to the enforcement of such law, or for certain reasons they may be opposed to the law as it now exists.

Undoubtedly much of the ill feeling that is directed against the pheasant by many of the South Dakota farmers is due not to the harm that the pheasant itself does, but rather to the damage that is done by the thoughtless, selfish or vicious hunter. Unfortunately there are some hunters who have little or no respect for the property rights of others. Such individuals are responsible in part at least for the large increase in numbers of the posted farms in the State. Every hunter should realize that every farm upon which he hunts is entitled to the same respect, at least, as is his own property. If this consideration is not shown, he may expect to find a steady increase in the number of posted farms and an ever increasing number of farmers who are losing faith in the law that protects the pheasant on the one hand and fails to protect his property on the other.

Prior to April 1, 1929, no scientific study had been made of the food and feeding habits of the pheasants in South Dakota. While, in general, it had been known that pheasants fed to some extent upon corn, small grain and other seeds, grasshoppers, beetles, caterpillars and other insects, exact information on what the pheasants actually consumed as food in various sections of the State throughout the year was not to be had, nor did any one know the variety and quantity of food that an average pheasant consumed in one meal, nor did any one know whether the average meal taken by pheasants was economically important to man or not. It was possible to ask a large number of ques-

tions regarding the food that pheasants eat, and yet to all of these, prior to this investigation, we would be compelled to answer, "We don't know." A few such questions follow: How much corn, wheat, oats, barley and other small grain does the average South Dakota pheasant eat in a meal during each of the 12 months of the year? From where and under what conditions were the corn and small grain procured? Does the pheasant eat more corn on an average in the southeastern section of the State which has about one-third of its crop area in corn, and a diminishing quantity in those sections in which a smaller percentage of the crop area is in corn? If this is true, does a similar condition exist for wheat, oats, barley and the other small grains? What percentage of the pheasants shot in South Dakota can be expected to have corn in their crops during each of the twelve months of the year, and how many kernels will each bird have in its crop on an average? At what time of year is most of the corn eaten by the pheasants, and at what time is the least amount taken? How much corn is eaten by an average pheasant in May and June? How much corn eaten during May and June is sprouted corn? What percentage of the pheasants shot in South Dakota can be expected to have wheat, or oats, or barley in their crops during each of the twelve months of the year and how many kernels will each bird have in its crop on an average?

How much wheat oats and barley eaten during April and May is sprouted grain? What species of seeds besides corn and small grain are eaten by South Dakota pheasants? What is the economic standing of such seeds? What important noxious weed seeds are eaten by South Dakota pheasants? What percentages of the pheasants shot in South Dakota may be expected to have the seeds of green foxtail, yellow foxtail, wild sunflower and wild buckwheat in their crops? How many of these seeds, on an average, may one expect to find in the crop of each pheasant? Are we warranted in believing that the pheasant exercises any important influence in holding in check any noxious weed by consuming the seeds?

What species of insects are eaten by South Dakota pheasants? What is the economic standing of these insects? What insects are eaten that are harmful to man? What insects are eaten that are useful to man? What percentage of pheasants shot in South Dakota may be expected to have grasshoppers and cutworms in their crops during each of the twelve months of the year? How many grasshoppers and cutworms may one expect to find, on an average, in the crops of these pheasants? Do the pheasants have an important influence in holding in check any important insect pest in South Dakota?

Of what does an average meal of an average South Dakota pheasant consist? What is the economic status of this meal? Is the pheasant capable of doing harm? Is it capable of doing good? If the pheasant is capable of doing both good and harm, what on the whole is the balance? Is the pheasant capable of doing harm locally on one farm or in one area and not in other areas? If so, can this be remedied or at least alleviated?

The questions asked in the preceding pages are answered, at least in part, in this bulletin. Additional questions might have been asked concerning the feeding habits of the pheasant that we would be unable to answer with the information that we have on hand. This is largely due to the fact that our work was done entirely in the laboratory. We have not studied the feeding habits of the pheasant in the field, and until a thoro field study is made, the economic status of the pheasant in South Dakota must be regarded as still unsettled. The pheasant has been accused of pulling up young corn plants and plants of small grain, pecking out seed and devouring it, pecking holes in melons, tomatoes, potatoes, the stalks of corn, etc., injuring small corn plants by pecking and exposing the roots, etc., etc. It is undoubtedly true that some of this destructive work can honestly be charged against the pheasant, but just how much of it occurs and under what conditions it takes place, we do not know. Whether or not most of the harmful work can be blamed upon a comparatively few pheasants is not known. Neither do we know how many pheasants may be maintained under average conditions on different types of farms without having the farmers suffer an appreciable loss because of the feeding habits of the birds. Nor do we know what effect severe prolonged dry spells have upon the feeding habits of the pheasant. Laboratory work such as we conducted cannot supply the answers to the problems just raised, but thru thoro field studies the necessary information may be obtained and the problems solved.

HOW THE INVESTIGATION WAS DIRECTED AND FINANCED

The project of investigation covered by this bulletin was a cooperative one between the State Department of Game and Fish and the State College of South Dakota. For the State Department, O. H. Johnson directed the work, while for the State College, H.C. Severin had charge of the project. The State Department of Game and Fish financed the project and supplied the 285 pheasant food tubes upon which this investigation was based. Mr. Paul Johnson was employed by the Department for twelve months, and Mr. Gerald Spawn for slightly more than five and one-half months. These men sorted the crop and gizzard contents of the food tubes, identified much of this matter, counted the number of specimens or portions of specimens of each species of plant and animal making up the food contents and recorded the data. In addition, Mr. Spawn prepared all the graphs appearing in this bulletin, and he performed much other valuable work. These men were paid $150.00 per month for their services. Mr. Mathew Fowlds of State College was employed by the hour to identify some of the seeds found in the food tubes of the pheasants, and the Department of Agronomy in which he was employed received $10.00 for his work. A total of $202.07 was expended in purchasing necessary laboratory supplies, while $15.45 was paid for necessary labor. The writer was called to Pierre before the project was begun to discuss plans of the investigation with the Director of the Department of Game and Fish and with the deputy game wardens. His total expense account on this trip was $3.30, and this was paid thru the Department of Game and Fish. A grand total of $2,868.33 was expended by the Department in carrying on this project, $2,662.96 of which was paid out in salaries. State College furnished all the scientific instruments that were needed during the course of the investigation, and the college also furnished, without charge, the necessary laboratory space.

All other men not listed in the preceding paragraph and to whom we are indebted for work done, contributed their labors gratuitously. The writer did not receive any compensation whatsoever for the work that he performed in connection with this project.

PLAN OF INVESTIGATION

It was agreed between the cooperating parties that the project should begin April 1, 1929 and continue for one year. On March 14, 1929, Mr. O. H. Johnson, twelve deputy game wardens and the writer met at Pierre to discuss the plan of investigation.

The deputy game wardens represented every section of the State where the pheasant had established itself. During the course of this meeting, the deputies were authorized and instructed to shoot a certain number of pheasants per month, to remove the food tubes from the birds and to send these food tubes in a preserved condition to the writer at Brookings. Each bird, before

it was to be shot, was to be observed by the deputy for fifteen minutes, if possible, and notes were to be taken regarding the apparent feeding habits of the bird during this time. Each deputy was asked to shoot some of his birds before 10 A.M. and some during the afternoon, preferably after 3 P.M., in order that we might have the opportunity of determining with the greatest degree of fairness the food taken during the day.

The writer demonstrated to the deputies how best to open up a pheasant and expose the food tube. Before the food tube was removed from the body of the bird, a string was tied tightly around the esophagus a short distance above the crop; two strings some distance apart, were tied around the soft stomach; and a fourth string was tied around the food tube beneath the gizzard. These strings kept the food in the crop and gizzard where it belonged, regardless of how roughly the food tube was later handled. The food tube was now removed from the carcass. The next step was to cut away the crop and gizzard from the remainder of the food tube without destroying the strings that held the food in these compartments. The crop and gizzard were then placed upon pieces of cheese cloth measuring about 8 by 8 inches. The walls of the crop and gizzard were now slit, and following this the corners and edges of cloth containing either the crop or gizzard were gathered up and tied in the form of a sac. The two sacs were then dropped into a vessel containing 70 per cent denatured alcohol where they were to be kept for three days. At the end of the three day period the cheese cloth sacs containing the crop and gizzard were to be removed from the preserving fluid and shipped in a pasteboard container to the laboratory at Brookings.

With each food tube sent us, the deputy game wardens were to submit a data card upon which the following information was to appear:

a. name of deputy
b. number of bird
c. sex and age of bird
d. exact locality in county where the bird was shot
e. date and hour of day when the bird was shot
f. description of place where the bird was shot
g. description of surrounding fields
h. remarks and observations.

A duplicate of a collector's data card, taken at random from his entire lot which he sent us, follows:

COLLECTOR'S DATA CARD

No.310 Submitted by E.H.White

Date: June 15,1929 Sex of bird: Male Age: 3 years

Hour when shot: 7:15 P.M.

Exact locality: S.E.Quarter,Sec.5,Twp.115,R. 52, in Hamlin County

Character of Place Where Killed: Corn field.

Surrounding Fields? Alfalfa on one side, oat field on other.

Remarks and Observations on this Particular Bird: I watched the bird a few minutes standing in corn field. He started to work over to the alfalfa when I shot him. I have had no complaints as to the pheasant.

It had been agreed between the cooperating parties that this investigation should be based upon an examination of 500 pheasant food tubes. Each of the nine cooperating deputies residing east of the Missouri River was to furnish us with 50 food tubes, while each of the two deputies from the western end of the State was instructed to send in 25. Data cards were now numbered from 1 to 500 and each deputy was given his quota. Late in the investigation a twelfth deputy was asked to furnish us with pheasant food tubes, and to him was given a batch of data cards numbered from 501 to 528.

At the end of the fiscal year it was found that no deputy had sent us his full quota of food tubes and that we had received a total of only 285. In table one are to be found the names of the cooperating deputies, their place of residence, the numbers of the data cards that were assigned to them (these indicate the number of food tubes which should have been sent us), and the number of food tubes which we actually received.

TABLE 1 - Names of the cooperating deputies and their place of residence, the numbers of data cards assigned to each deputy, and the numbers of food tubes sent us.

Numbers of data cards assigned each deputy	Names of cooperating deputies and their place of residence	Number of food tubes sent us
1- 25	V.L. Burrington, Deadwood	12
26- 50	E.G. Adams, Custer	15
51- 100	Harry Cotman, Huron & Lake City	26
101- 150	Harry Piner, Pierre	41
151- 200	T.L.Tollefson, Waubay	4
201- 250	George Woods, Aberdeen	20
251- 300	Henry H. Deblon, Watertown	31
301- 350	E.H. White, Castlewood	30
351- 400	E.C. Coffey, Madison	21
401- 450	Jack Riley, Parker	40
451- 500	Charles A. Ferguson, Mitchell	42
501- 528	L. C. Hawley, Huron	4
	T o t a l	* 286

* The food tube from bird number 212 was lost in the mail and, therefore, the investigation is based upon an examination of the contents of 285 crops and gizzards.

From April through September, the six warmest months of the year and which are also the growing months for plants, a total of 198 pheasant food tubes were sent us for examination, while during the remainder of the year only 87 were mailed us (Table 2). In other words, during the warmer months of the year we received on an average 33 food tubes per month, while during the colder months only 14 were sent us per month. Live insects may be taken as food by pheasants chiefly during the warmer months of the year, while from October through March, they are either not available at all or they are scarce. During the warmer months spiders, millipedes, succulent green plant food, many kinds of seeds, and fruits are also eaten. During the colder months, seeds, dead portions of plants and dead insects are the most prevalent organic matter that the pheasant may consume.

The birds, whose food tubes were sent us, were shot in 40 different counties (Fig. 1), the majority in Turner, Hamlin, Beadle, Davison, Lake, Sully, Codington, Brown, Butte, Pennington, Hughes, Hutchinson, Hanson and Sanborn counties. They were killed on every type of cultivated and uncultivated field in the State, in order that a fair conclusion might be reached regarding the food that the pheasants consume.

Table 2 indicates the number of birds that were shot for this investigation during each month of the year, also the number shot during each quarter of the year.

TABLE 2.-Number of birds shot for this investigation during each month of the year.

January	14 birds	April	34 birds
February.	14 birds	May	38 birds
March	13 birds	June	33 birds
Total, 1st quarter -	41 birds	Total, 2nd quarter -	105 birds
July	35 birds	October	26 birds
August	34 birds	November	10 birds
September	24 birds	December	10 birds
Total, 3rd quarter -	93 birds	Total, 4th quarter -	46 birds

When a food tube arrived at the laboratory, the crop and gizzard contents were analyzed separately, but the methods followed were the same for both. First the animal food of the crop

was sorted out from the general contents and then the vegetable matter was removed. There remained, therefore, only the inorganic matter consisting mainly of small stones and other soil particles. The stones were counted and measured by volume and the data recorded. The plant matter was then sorted into lots, each lot containing identical material. In other words, seeds were sorted into kinds or species as were also other identifiable plant materials. Such plant matter as could not be identified was measured in cubic centimeters and labeled conglomerate vegetation. This consisted mainly of portions of leaves, stems, roots, and hulls of seeds. The insect and other animal food of the crop was now identified.

The number of specimens of each identified species of plant or animal were counted and following this, a record was made of the findings. The sorted food of the crop was now thoroughly dried and placed in either No.000 gelatine capsules or in glass shell vials measuring 75x22 mm. A large amount of food of a particular kind was stored by itself in a glass vial, but small amounts were placed in gelatine capsules. In each vial or capsule there was placed a label which identified the food contents and which also stated the number of specimens which the receptacle contained. In order that the crop food of one pheasant might be stored in a space as compact as possible, the capsules were crowded into one or more glass vials.

The classified food from each pheasant was not discarded even after a permanent record had been made of it, but it was stored so that it might be studied again in the future should necessity arise for so doing.

For storage purposes, the following plan was followed. For each of the 285 pheasants, a board measuring 1 x 3.5 x 11 inches was obtained. Through each of these boards two rows of one-inch holes were bored. Each row contained six holes. The holes were just large enough to hold the glass vials that were used for storing the classified food. Two strips of plain lattice molding were nailed lengthwise over the bottom of each board, thus closing the holes on this side. A third strip of molding was nailed over the end of the boards.

The shell vials containing the crop contents of a pheasant were placed in the left-hand row of holes of a board, while the vials containing the gizzard contents were placed in the right-hand row of holes of the same board. Upon the end board was placed the number of the pheasant.

Shelves 11 inches deep and 7 inches apart were constructed and on these the boards were arranged in consecutive order. In other words, board number one contained all the food of pheasant number one; board number two contained all the food of pheasant number two, etc., etc.

THE FISCAL YEAR DURING WHICH THE INVESTIGATION WAS CONDUCTED

The fiscal year over which the investigation extended, began April 1, 1929 and ended March 31, 1930. The first pheasants used in this investigation were shot April 1, 1929, while the last were killed April 29, 1930. As was to be expected, the total precipitation varied considerably in the various counties of the State. In general, the southeastern section of South Dakota and the Black Hills counties received a total precipitation greater than is usual for the period of the 12 months during which this investigation was carried on. The remainder of the State, on the other hand, had a total precipitation smaller than usual. The southeastern section of the State referred to, was bounded by Brookings County on the north and by Davison County and the eastern portions of Douglas and Charles Mix counties on the west. The Black Hills counties comprised all of Lawrence County and portions of Butte, Pennington and Custer counties. The monthly distribution of the precipitation varied considerably for each county and frequently deviated considerably from the normal or average. In those counties in which there was a total yearly precipitation greater than average, the plus departure from the average varied from 0.15 to 4.63 inches. In those counties in which there was a total precipitation smaller than the average, the minus departure from the average varied from 1.62 to 8.31 inches.

The food supply of the pheasants during the year of this investigation was amply abundant to maintain the pheasant population of the State. Available water was lacking or very much reduced in some sections of the State, a condition which forced some of the pheasants to take on abnormal feeding habits. Undoubtedly the drought that prevailed over some of the State changed the complexion of the plant population for those sections, with the consequence that the drought loving plants became more abundant, made more luxuriant growth and produced more seed than usual, but in general, the drought was not severe except in limited areas. As a consequence, over most of the State, the plant population was about normal, or if off normal, the weather conditions favored the more arid plants.

The insect population over the State was about normal except for grasshoppers and cutworms. Grasshoppers were more abundant than usual and were threatening to become a menace, especially in the south-central portion of the State. Cutworms were exceedingly abundant, especially in the eastern third of South Dakota.

AN ECONOMIC CLASSIFICATION OF THE FOOD FOUND IN 285 SOUTH DAKOTA PHEASANTS

An ideal and desirable economic classification of the food that is eaten by pheasants would classify each different food as harmful, neutral or useful to mankind. However, in practice, it is impossible to so classify the various foods with any degree of accuracy.

Corn, wheat, oats, barley, rye and emmer are ordinarily useful to man, but even such plants when they grow where they are not wanted may be classed as either neutral or harmful. Again, much of the corn or small grain that is eaten by pheasants may be considered as waste grain, for the pheasants may pick this up from the highways or they may find it lying on the ground where it was dropped thru shattering, threshing, etc.

A weed is usually defined as a plant growing out of place, or as a plant growing where one wishes to grow other plants. Pheasants feed upon the seeds of many weeds, many of which are highly injurious to the farmer, while others are not nearly so harmful. When a pheasant has been found to feed upon the seeds of, let us say, Russian thistle, it does not follow that the seeds were picked up from a cultivated field. They might have been picked up from a dozen or more different places, where it makes no material difference to man whether Russian thistle grows there or not. And yet it may be argued that from such places Russian thistle may ultimately invade cultivated areas. If one knew just where each pheasant picked up its seeds of Russian thistle, and if one knew how abundant the seeds were that remained, then one could approximate more accurately a classification of the service that a pheasant performed for mankind when it devoured the seeds.

Approximately one-half of the pheasant food tubes whichwe examined contained green and yellow foxtail seeds. Green and yellow foxtail are noxious weeds when they occur in cultivated fields. A grain field that is well stocked with these weeds may produce many millions of foxtail seeds per acre per year. And yet, the 285 pheasants which we examined had in their food tubes a total of only 27,801 green foxtail seeds and 15,335 yellow foxtail seeds. If it is argued that this quantity of seed represents little more than one meal of 285 pheasants,let us remember the immense acreage in South Dakota that is producing green and yellow foxtail seed.

That the pheasant is not important in holding down green and yellow foxtail by devouring the seeds of these two weeds is apparent to any farmer. He need only go out to his grain or corn stubble in the spring and he will find many more green and yellow foxtail seeds per square foot of ground than nature

can possibly use in producing the next year's stand of green and yellow foxtail plants. In other words, the foxtail plants are altogether too prolific as seed bearers to be materially reduced in numbers by the enemies that feed upon the plants or seeds.

Most farmers in South Dakota will undoubtedly class the wild rose as a harmful plant. It is not a desirable plant to have in a pasture or grain field and certainly it is highly objectionable when it is found in numbers in a hay meadow. On the other hand, we know that some of our highly beneficial birds use the hips and seeds of the wild rose as food. The ring-necked pheasant feeds upon the seeds of the wild rose rather generously, for 116 of the 285 pheasants which we examined contained wild rose seeds. These birds had eaten a total of 1699 rose seeds or approximately 15 seeds per bird. Because the wild rose is used as food by beneficial birds, some investigators have changed the classification of this plant from an injurious to a neutral category.

It is customary with most investigators to classify all species of grasshoppers as injurious. While it is true that most grasshoppers are potentially injurious, some species never become injurious, for they never feed upon a plant that is useful to man. As an example of a harmless species of grasshopper, Hypochlora alba (Dodge) or the mugwort hopper might be cited. Melanoplus bowditchi canus Heb. or the sage grasshopper is another hopper which never does any harm to mankind in South Dakota. Both of these hoppers may be used as food by the pheasant, tho usually only in small quantity. Whenever a pheasant feeds upon a species of hopper that is potentially injurious, it does not follow that the pheasant is actually doing the farmer or gardener a good service. Such a hopper, when eaten, may have been feeding upon vegetation that was of no economic importance to man whatsoever or it might even have been feeding upon a noxious weed. Further, the hopper may have been picked up after it had died, or it may have been picked up late in the year after it had reproduced and was ready to die.

Lady bugs and their larvae (Coccinelidae) are usually regarded as useful insects because most of them feed upon plant lice or aphids. In South Dakota we have more species of plant lice that feed upon harmful and neutral plants than we have species that feed upon useful plants. Whenever a species of aphid attacks a cultivated plant it must be considered as harmful, and should a species attack a noxious weed it must be considered as useful. If a lady bug devours a useful aphid, the act is not beneficial to man, but if the aphid was harmful, then the act would have been beneficial to man. In 1930, South Dakota experienced an unusually severe outbreak of aphids. The green bug or green aphid did an immense amount of damage, especially to some of our small grain. During the latter part of

June and early July certain species of lady bugs became astonishingly abundant in our grain fields. Oftentimes, hundreds of lady bugs would be found upon a single oat or wheat plant, and all of these lady bugs fed upon the green bugs. Suppose now that a pheasant were to come along and devour some of these lady bugs. Such a pheasant would then be doing harm to the farmer.

From the examples cited, it is apparent that not all insects are injurious and should be destroyed; neither are they all beneficial and should be protected. It is possible to classify many of our species of insects into economic categories, but others cannot be so classified. Some may be neutral under ordinary circumstances, with the possibility of becoming injurious or beneficial under certain conditions, while others may be ordinarily beneficial or injurious, but should conditions change, then their classifications would likewise change. Some species of insects may be unimportant economically in one section of the State, but in another area the same species may be very important. The statements made above regarding insects are also true of plants.

An economic classification of the insects that are found in the food tubes of our pheasants becomes still more involved when we remember that such insects might have been parasitized by a primary, secondary, tertiary or quaternary parasite. Suppose a grasshopper were parasitized by some sarcophagid maggots. Such a grasshopper would be doomed to die within a few days at the longest. If these maggots were permitted to develop, another generation or two of the parasites might be produced from this source during the same year, and this might mean the destruction of quite a number of additional grasshoppers. However, if a pheasant fed upon the parasitized grasshopper, not only is the grasshopper destroyed, but the beneficial maggots are also killed. Thus it is conceivable that a pheasant may do harm even when feeding upon grasshoppers. Let us suppose again that a grasshopper is parasitized by some sarcophagid maggots, but in this instance let us suppose further that secondary parasites are present in the grasshopper's body and are destroying the primary parasites or sarcophagid maggots. Under such conditions the grasshopper is destroyed by the sarcophagid maggots but these in turn are killed by the secondary parasites. A pheasant feeding upon such a grasshopper would be doing a service to man, for it is to his interest to have the secondary parasites kept down to the minimum numbers. Since parasitism is the usual rather than the uncommon state of affairs amongst insects, it is readily understandable why an economic classification of the insects found in the food tubes of pheasants may be not only extremely difficult but also incorrect.

W. L. McAtee, in charge of the Food Habits Research of the Bureau of Biological Survey, U. S. Department of Agriculture, wrote me as follows, regarding an economic classification of the food eaten by wild animals in general:

"Making an economic classification without explanatory and saving remarks in some cases cannot be considered strictly accurage. In fact, the inter-relations of organisms is such that it is hardly possible to classify them so strictly from an economic point of view. It is better to assume that the classification indicates economic tendencies which may not be in evidence in the same way at all times and places." The writer agrees thoroly with these statements.

A list of all the species of seeds, and a list of all the species of animals whose bodies were found in an unbroken or slightly broken condition in the food tubes of our pheasants were submitted to W. L. McAtee with the request that he indicate in each case whether he considered the species harmful, neutral or useful to man. This, Mr. McAtee has kindly done, and in table 3 we submit his classifications. While no two people probably would make the same economic classification of all these species of animals and seeds, it is undoubtedly true that few, if any, people would be better qualified to attempt this difficult task.

TABLE 3. - An economic classification of the seeds and animals (whole or slightly broken) found in the crops and gizzards of 285 South Dakota pheasants, the numbers which were assigned to each species of animal or seed, the total number of specimens of each species eaten and the number of pheasants that fed upon each species of animal or seed.

ANIMAL FOOD

Numbers assigned to species		Economic classification	Total number of each species of animal used as food	Total number of birds in which each species was found	Total number of each species in crop	Total number of each species in gizzard	Average number of each species per crop for year
	Phylum Arthropoda						
	Class Hexapoda (Insects)						
	Order Coleoptera (Beetles)						
	Anthicidae (Ant-like flower beetles)						
1	Anthicus cervinus Laf.	N	4	4	4	0	0.012
2	Anthicus sp?	N	2	2	2	0	0.005
3	Notoxus anchora Hentz.	N	2	1	1	1	0.002
	Byrrhidae (Pill beetles)						
4	Byrrhidae sp?	N	2	1	1	1	0.003
	Carabidae (Ground-beetles)						
5	Agonoderus pallipes (Fab.) = seed corn beetle	H	4	4	3	1	0.007
6	Amara impuncticollis Say	N	1	1	0	1	0

Numbers assigned to species		Economic classification	Total number of each species of animal used as food	Total number of birds in which each species was found	Total number of each species in crop	Total number of each species in gizzard	Average number of each species per crop for the year
7	Amara latior Kby.	N	1	1	1	0	0.002
8	Amara musculus Say	N	14	1	14	0	0.035
9	Amara sp?	N	2	2	2	0	0.013
10	Bembidion nitidum (Kby.)	U	1	1	1	0	0.002
11	Calosoma calidum Fab.= fiery hunter	U	1	1	0	1	0
12	Calosoma sp?	U	0	0	0	0	0
13	Caratidae sp?	?	9	7	2	3 grubs 4 beetles	0.009
14	Carabinae sp?	?	0	0	0	0	0
15	Harpalus erraticus Say	N	2	2	1	1	0.004
16	Harpalus herbivagus Say	N	5	1	5	0	0.012
17	Harpalus sp?	N	130	29	94 beetles 12 grubs	24 beetles	0.299
18	Lebia scapularis Dej.	U	1	1	1	0	0.003
19	Pasimachus elongatus Lec.	U	1	1	1	0	0.003
20	Piosoma alternata Lec.	N	2	2	2	0	0.005
21	Platynus placidus (Say)	U	1	1	1	0	0.002
22	Pterostichus lucublandus Say	N	2	2	2	0	0.005
23	Pterostichus stygicus Say	N	3	1	3	0	0.007
24	Stenocellus sp?	U	1	1	1	0	0.008

Numbers assigned to species		Economic classification	Total number of each species of animal used as food	Total number of birds in which each species was found	Total number of each species in crop	Total number of each species in gizzard	Average number of each species per crop for the year
	Chrysomelidae (Leaf beetles)						
25	Calligrapha lunata (Fab.)	N	1	1	1	0	0.007
26	Calligrapha praecelsis Rogers	N	2	1	0	2	0
27	Cassida sp?	N	3	2	2 grubs 1 pupa	0	0.007
28	Chalcoides helxines (L.) = willow flea-beetles	H	1	1	1	0	0.003
29	Chelymorpha cassidea (Fab.) = milkweed tortoise beetle	N	1	1	1	0	0.002
30	Chrysodina globosa (Oliv.)	H	1	1	0	1	0
31	Chrysomelidae sp?	?	0	0	0	0	0
32	Colaspis favosa Say	H	1	1	1	0	0.002
33	Diabrotica 12-punctata (Fab.) = 12-spotted cucumber beetle or southern corn root-worm	H	1	1	1	0	0.002
34	Diabrotica vittata (Fab.) = striped cucumber beetle	H	7	1	6	1	0.015
35	Disonycha triangularis (Say)	N	3	3	2	1	0.005
36	Disonycha sp?	N	3	1	3 grubs	0	0.008
37	Galeruca pomonae Scop.	N	1	1	1 grub	0	0.003
38	Galeruca sp?	N	2	1	2 grubs	0	0.005
39	Galerucella sp?	N	4	1	4 grubs	0	0.010
40	Graphops curtipennis (Melsh.)	H	5	1	5	0	0.013

Numbers assigned to species		Economic classification	Total number of each species of animal used as food	Total number of birds in which each species was found	Total number of each species in crop	Total number of each species in gizzard	Average number of each species per crop for the year
41	Haltica bimarginata Say	N	1	1	0	1	0
42	Hispinae sp?	N	0	0	0	0	0
43	Jonthonota nigripes (Oliv.) = black-legged tortoise beetle	N	14	6	8	6	0.02
44	Lema trilineata (Oliv.) = 3-lined potato beetle	H	11	5	2	9	0.005
45	Metriona bivittata (Say) = 2-lined tortoise beetle	N	17	8	11 beetles 1 grub	5	0.030
46	Metriona purpurpata (Boh.) = purple tortoise beetle	N	1	1	1	0	0.002
47	Nodonota puncticollis (Say)	H	1	1	0	1	0
48	Pachybrachys femoratus (Oliv.)	N	2	1	2	0	0.005
49	Pachybrachys othonus (Say)	N	1	1	1	0	0.003
50	Pachybrachys sp?	N	1	1	1	0	0.003
51	Paria canella aterrima (Oliv.) = strawberry root worm	H	33	1	29	4	0.073
52	Paria canella thoracica (Melsh.) = strawberry root worm	H	6	1	5	1	0.013
53	Systena taeniata (Say) = banded flea-beetle	H	1	1	1	0	0.002
54	Trirhabda canadensis (Kby.)	N	1	1	1	0	0.002
55	Trirhatda sp?	N	22	1	21	1 grub	0.053
56	Zygogramma exclamationis (Fab.)	N	4	3	1	3	0.003
57	Zygogramma suturalis casta Rogers	N	1	1	0	1	0

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	Cicindelidae(Tiger-beetles)						
58	Cicindela sp?	U	1	1	0	1	0
	Cleridae (Checkered beetles)						
59	Trichodes nuttalli Kby.	U	1	1	1	0	0.002
	Coccinellidae (Lady-bugs)						
60	Coccinelid larvae, sp?	U	1	1	1	0	0.002
61	Hippodamia parenthesis (Say) = parenthesis lady-beetles	U	2	2	1	1	0.008
	Elateridae (Click-beetles, Wireworms)						
62	Aeolus dorsalis (Say)	H	6	5	5	1	0.012
63	Elateridae sp?	?	1	1	0	1	0
64	Lacon rectangularis (Say)	H	1	1	1	0	0.003
65	Limonius confusus Lec.	H	1	1	1	0	0.002
66	Ludius inflatus (Say)	H	1	1	1	0	0.002
67	Melanotus sp?	H	14	6	12	2	0.030
68	Monocrepidius auritus (Hbst.)	H	1	1	0	1	0

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	Hydrophilidae (Water-scavenger beetles)						
70	Cercyon sp?	N	1	1	1	0	0.002
	Scarabaeidae (Lamellicorn beetles)						
71	Anomala innuba (Fab.)	H	7	1	7	0	0.015
72	Aphodius bicolor Say	N	2	2	2	0	0.005
73	Aphodius consentaneus Lec.	N	10	1	10	0	0.024
74	Aphodius femoralis Say	N	23	2	23	0	0.063
75	Aphodius fimetarius (L)	N	1	1	1	0	0.002
76	Aphodius granarius (L.)	N	1	1	1	0	0.002
77	Aphodius inquinatus (Hbst.)	N	19	8	12	7	0.029
78	Aphodius sp?	N	2	1	2	0	0.005
79	Phyllophaga tristis (Fab.) =a species of white-grub	H	2	2	0	2	0
80	Phyllophaga sp?	H	1	1	0	1	0
81	Scarabaeidae sp?	?	1	1	0	1	0
	Staphylinidae (Rove-beetles)						
82	Paederus littorarius Grav.	N	1	1	1	0	0.008
83	Staphylinidae sp?	?	3	3	3	0	0.007

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	Tenebrionidae (Darkling beetles)						
84	Alphitobius sp?	?	1	1	1	0	0.004
85	Eleodes opaca (Say) = plains false wireworm	H	3	2	2	1	0.005
86	Eleodes tricostata (Say)	H	8	5	3	5	0.007
69	Eleodes sp?	H	1	1	1	0	0.002
87	Tenebrionidae sp?	?	0	0	0	0	0
	Curculionidae (Typical snout-beetles)						
88	Sphenophorus aequalis Gyll. =clay-colored bill bug	H	1	1	0	1	0
89	Rhynocophora (genera and species undetermined)	H	72	21	47	25	0.107
90	Beetle - sp?	?	7	5	4	3	0.009
	Order Orthoptera (Grasshoppers Crickets, Katydids, etc.)						
	Acrididae (Locusts or short-horned grasshoppers)						
91	Arphia pseudonietana (Thos.) northwestern red-winged locust	H	2	2	2	0	0.012
92	Chloealtis conspersa Harris = sprinkled locust	H	1	1	1	0	0.002

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93	Chorthippus curtipennis curtipennis (Harris) = marsh meadow locust	H	2	2	0	2	0
94	Chortophaga viridifasciata (Deg.) = green-striped locust	H	2	1	1	1	0.002
95	Encoptolophus costalis (Sc.)	H	1	1	1	0	0.006
96	Encoptolophus Sp?	H	1	1	1	0	0.002
97	Hypochlora alba (Dodge) = mugwort locust	H	1	1	1	0	0.002
98	Melanoplus bivittatus (Say) = two-striped locust	H	18	10	13	5	0.154
99	Melanoplus borealis junius (Dodge) = northern locust	H	1	1	0	1	0
100	Melanoplus confusus Sc.= little pasture locust	H	4	1	4	0	0.009
101	Melanoplus dawsoni (Sc.) = Dawson's locust	H	23	10	21	2	0.062
102	Melanoplus differentialis (Thos.) = differential locust	H	19	13	19	0	0.065
103	Melanoplus femur-rubrum femur-rubrum (DeG.) = red-legged locust	H	232	36	224	8	0.789
104	Melanoplus gladstoni Sc.= Gladstone's locust	H	9	4	8	1	0.032
105	Melanoplus keeleri luridus (Dodge) = broad-necked locust	H	2	1	2	0	0.006
106	Melanoplus mexicanus mexicanus (Sauss.) = lesser migratory locust	H	15	11	14	1	0.05

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107	Melanoplus sp?	H	51	16	45	6	0.132
108	Opeia obscura (Thos.)	H	3	3	3	0	0.02
109	Phoetaliotes nebrascensis (Thos.) = large-headed locust	H	30	10	28	2	0.13
	Grasshopper sp?	H?	14	8	10	4	0.024
	Gryllidae (Crickets)						
110	Gryllus assimilis (Fabr.) = black field cricket	H	97	26	86	11	0.273
111	Nemobius fasciatus fasciatus (DeG.)	N	122	3	114	8	0.386
112	Oecanthus nigricornis (F.Walk.) =black-horned tree cricket	N	11	8	10	1	0.032
	Tettigoniidae (Kadydids)						
113	Conocephalus fasciatus fasciatus (DeG.)=slender meadow grasshopper	N	9	4	9	0	0.028
114	Conocephalus saltans (Sc.) = wingless prairie grasshopper	N	2	2	2	0	0.007
115	Conocephalus strictus (Sc.) =straight-lanced grasshopper	N	1	1	1	0	0.002
116	Conocephalus sp?	N	2	1	2	0	0.005
117	Neoconocephalus ensiger (Harr.) = sword-bearer	N	1	1	0	1	0

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	Orders-Hemiptera-Homoptera (bugs)						
	Aphididae (Plant lice or aphids)						
118	Aphids sp?	H	3	1	0	3	0
	Cicadellidae (Leaf-hoppers)						
119	Draeculacephalus manitobiana Ball	N	1	1	1	0	0.004
120	Eutettix strobi (Fitch)	H	1	1	1	0	0.004
	Fulgoridae (Lantern-fly family)						
121	Scolops sp?	N	3	2	2 nymphs 1 adult	0	0.007
	Lygaeidae (Chinch-bug family)						
122	Lygaeidae sp?	N	1	1	1	0	0.002
123	Nysius ericae (Schill.) = false chinch bug	H	2	1	2	0	0.006
124	Sphragisticus nebulosus (Fall.)	N	1	1	1	0	0.002
	Membracidae (Tree-hoppers)						
125	Campylenchia latipes (Say) = wide-footed tree-hopper	N	3	3	2	1	0.005

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126	Ceresa bubalus (Fabr.) = buffalo tree-hopper	H	1	1	1	0	0.002
127	Publilia modesta Uhl.	N	1	1	1	0	0.002
	Miridae (Leaf-bugs)						
128	Adelphocoris rapidus (Say)	H	16	9	16	0	0.042
129	Lygus elisus Van D.	H	1	1	1	0	0.002
130	Lygus plagiatus Uhl.	H	1	1	1	0	0.002
131	Lygus pratensis oblineatus (Say)	H	1	1	1	0	0.030
	Nabidae (Damsel-bugs)						
132	Nabis ferus (L.) common damsel-bug	U	1	1	1	0	0.002
133	Nabis roseipennis Reuter = rose-winged damsel-bug	U	3	2	3	0	0.007
	Pentatomidae (Stink-bugs)						
134	Coenus delius (Say)	N	2	1	2	0	0.005
135	Pentatomidae sp? (Nymphs)	H?	3	3	2 nymphs 1 adult	0	0.007
136	Peribalus limbolarius Stal.	N	8	5	6	2	0.018
137	Thyanta custator (Fabr.) = red-shouldered plant-bug	H?	2	1	2	0	0.006

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	Phymatidae (Ambush-bugs)						
138	Phymata erosa fasciata (Gray) = banded ambush bug	U	3	2	1	2	0.003
	Reduviidae (Assasin-bugs)						
139	Reduviidae sp?	U	0	0	0	0	0
	Scutelleridae (Shield-backed bugs)						
140	Eurygaster alternatus (Say) =alternate shield-bug	N	2	1	2	0	0.005
141	Homoemus bijugis Uhl. = bijugate shield-bug	N	4	2	1	3	0.002
142	Scutelleridae sp?	N	1	1	1	0	0.003
	Hemiptera sp?	?	6	6	5	1	0.014
	Order Hymenoptera						
	Braconidae (Braconids)						
143	Braconidae sp?	U?	2	2	2	0	0.005
	Chalcididae (Chalcid-flies)						
144	Chalcididae sp?	U?	1	1	0	1	0

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	Formicidae (A family of ants)						
145	Camponotus sp? = carpenter ant	H	2	1	2	0	0.007
146	Formica fusca L.=fuscous ant	H	6	4	5	1	0.012
147	Formica rufa L.= red ant	H	3	2	3	0	0.009
148	Formica sanguinea aserva (Forel.) = sanguinary ant	H	29	1	29	0	0.071
149	Formica sp ?	H	9	8	3	6	0.013
150	Lasius niger L. = corn field ant	H	264	12	244	20	0.809
151	Lasius sp?	H	1	1	0	1	0
152	Tapinoma sp?	H	35	1	0	35	0
	Myrmicidae (A family of ants)						
156	Myrmica rubra Buck	H	2	1	0	2	0
157	Solenopsis molesta Say = thief ant	H	1	1	1	0	0.003
	Ichneumonidae (Ichneumon flies						
153	Ichneumon sp?	U?	2	2	1	1	0.002
154	Ophion sp?	U	1	1	0	1	0
155	Paniscus sp?	U	1	1	1	0	0.002

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	Philanthidae (Philanthid wasps)						
158	Cerceris clypeata Dahlb.	U	2	1	0	2	0
	Sphecidae (Sphecid wasps)						
159	Sphecidae sp?	U	1	1	0	1	0
	Tenthredinidae (A Sawfly family						
160	Allantus sp?	H	10	1	10 grubs	0	0.024
161	Nematinae sp?	H	2	1	2	0	0.005
	Ants - sp?	H	15	2	1	14	0.003
	Hymenoptera - sp?	?	3	2	1 larva 1 pupa	1	0.005
	Order Diptera (Flies)						
	Asilidae (Robber flies)						
162	Asilidae sp?	U	1	1	1	0	0.002
163	Asilus paropus Walker	U	1	1	1	0	0.002
164	Proctacanthus sp?	U	1	1	0	1	0

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	Bibionidae (March-flies)						
165	Bibio albipennis Say larvae = white winged march-fly	N or H	885	57	855	30	2.207
	Bibio albipennis Say adults	N or H	62	4	55	7	0.124
	Borboridae (Borborid flies)						
167	Borborus equinus Fallen	N	394	1	394	0	0.86
	Chironomidae (Midges)						
168	Chironomidae sp?	N	1	1	1	0	0.002
	Dolichopodidae (Long-legged flies)						
169	Dolichopus cuprinus Wiedemann	N	1	1	1	0	0.003
	Empididae (Dance-flies)						
170	Empis sp?	N	4	1	4	0	0.009
	Leptidae (Snipe-flies)						
171	Leptidae sp?	U	3	3	3	0	0.007

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	Muscidae (Muscid-flies)						
172	Calliphora sp?	N	9	1	9 maggots	0	0.021
	Tachinidae (Tachina-flies)						
173	Tachinidae sp?	U	1	1	1	0	0.002
	Tipulidae (Crane-flies)						
174	Tipulidae sp?	N	1	1	1	0	0.003
	Diptera - sp?	?	15	9	9	6	0.026
	Order Lepidoptera						
	Arctiidae (Tiger moths)						
175	Arctiidae sp?	H	3	3	1 caterpillar	2 caterpillars	0.002
	Geometridae (Green geometrids)						
177	Geometrid sp?	H	2	2	1 moth, 1 caterpillar	0	0.006
178	Caterpillars not identified	H?	2	2	2 caterpillars	0	0.004

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185	Moth - sp?	H ?	7	6	5 moths 1 pupa	1 moth	0.016
	Order Neuroptera						
	Chrysopidae (Lace-wing flies)						
186	Chrysopa occulata Say	U	2	1	2	0	0.005
187	Chrysopa plorabunda Fitch	U	7	3	7	0	0.017
	Class Arachnida (Spiders, etc.)						
	Order Araneida (Spiders)						
188	Spiders - sp?	U	68	30	42	26	0.124
	Class Diplopoda (Millipedes)						
189	Millipedes - sp?	N	15	10	7	8	0.020
	Phylum Mollusca						
	Class Gasteropoda						
190	Snails-sp?	N or H	13	5	12	1	0.052
	Phylum Chordata						
	Class Aves						
191	Pheasant egg shell	U	.466	2			

PLANT FOOD

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
	Division I. Pteridophyta (Ferns and fern allies)						
	Marsileaceae (Marsilea family)						
1	Marsilea vestita (?) Hook. and Grev. = water fern	N	7 sporocarps	2	1 sporocarp in 1 crop	6 sporocarps in 2 gizzards	0.006
	Division II. Spermatophyta (Seed or flowering plants)						
	Class A. Monocotyledons (One cotyledon in embryo)						
	Sparganiaceae (Bur-reed family)						
2	Sparganium eurycarpum Englem. = bur-reed	U	27	4	0	27 seeds in 4 gizzards	0
	Najadaceae (Pondweed family)						
3	Potamogeton pectinatus L. = pondweed	U	25	2	0	25 seeds in 2 gizzards	0
	Alismaceae (Water plantain family)						
4	Alisma plantago-aquatica L. = water plantain	U	4	1	0	4 seeds in 1 gizzard	0
	Gramineae (Grass family)						
5	Alopecurus pratensis L. = meadow foxtail	U	441	1	270 seeds in 1 crop	171 seeds in 1 gizzard	0.68 2

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
6	Andropogon sorghum Brot. = sorghum	U	10	1	10 in 1	0	0.035
7	Andropogon sp? = blue stem	U	4	2	4 in 2	0	0.016
8	Avena fatua L. = wild oats	H	898	21	813 in 16	85 in 10	2.472
9	Avena sativa L = oa ts	U	5548	88	4924 in 80	624 in 49	16.3
10	Beckmannia erucaeformis Host. = false timothy	U	9	1	9 in 1	0	0.029
11	Bromus inermis Leyss. = brome grass	H	2	1	0	2 in 1	0
12	Buchloe dactyloides Engelm. = buffalo grass	U	64	3	0	64 in 3	0
13	Danthonia spicata Beauv. = wild oat grass	N	1530	1	1360 in 1	170 in 1	3.238
14	Digitaria sanguinalis Scop. = crab grass	H	36	2	0	36 in 2	0
15	Distichlis spicata Greene = alkali grass	N	37	1	6 in 1	31 in 1	0.018
16	Echinochloa crusgalli Beauv. = barnyard grass	H	601	30	383 in 13	218 in 23	2.115
17	Hordeum jubatum L. = squirrel-tail grass or wild barley	H	2	1	2 in 1	0	0.007
18	Hordeum vulgare L. = barley	U	7351	114	6036 in 91	1315 in 84	20.8
19	Panicum capillare L. = old-witch grass	H	19	7	6 in 6	13 in 4	0.024
20	Panicum miliaceum L-proso millet	U	150	3	126 in 3	24 in 1	0.3917
21	Panicum virgatum L. =switch grass	N	7	2	1 in 1	6 in 1	0.003

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crop	Total number of seeds in gizzard	Average number of seeds per crop for the year
22	Panicum sp? = panic grass	N	295	7	59 in 2	236 in 7	0.144
23	Poa pratensis L. =Kentucky blue grass	U	1 seed in 2 spiklets	1	0	1 in 1	0
24	Secale cereale L. = rye	U	706	8	619 in 6	87 in 5	1.64
25	Setaria glauca Beauv. =yellow foxtail or pigeon grass	H	15,335	140	6134 in 74	9201 in 133	19.465
26	Setaria italica Beauv.=millet	U	578	8	183 in 5	395 in 8	1.407
27	Setaria viridis Beauv.=green foxtail or pigeon grass	H	27,801	140	14,411 in 100	13,390 in 124	53.348
28	Setaria sp? = foxtail	?	34	2	33 in 1	1 in 1	0.198
29	Sporobolus neglectus Nash.= small rush grass	N	74	4	21 in 4	53 in 1	0.087
30	Stipa spartea Trin. = needle grass	N	1	1	0	1 in 1	0
31	Stipa viridula Trin =feather grass	N	3	2	1 in 1	2 in 1	0.002
32	Triticum sativum Lam.=wheat	U	9,767	106	7858 in 91	1909 in 76	28.1
33	Triticum sativum dicoccum Schr. = emmer	U	117	9	72 in 8	45 in 4	0.272
34	Zea mays L. = corn	U	4,430	126	4114 in 121	316 in 83	18.15
	Cyperaceae (Sedge family)						
35	Carex sp? = sedge	N	902	29	2 in 1	900 in 28	0.004

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crop	Total number of seeds in gizzard	Average number of seeds per crop for the year
	Juncaceae (Rush family)						
36	Juncus sp? = rush	N	87 seeds & 147 pods containing 32,487 seeds total seeds 32,574	3	749 in 2	31,825 in 2	1.891
	Liliaceae (Lily family)						
37	Asparagus officinalis L. = garden asparagus	U	13 seed pods containing 12 seeds	1	12 in 1	0	0.029
38	Maianthemum canadense Desf. = two-leaved Solomon's seal	N	2,539	19	1 in 1	2,538 in 19	0.003
39	Smilax sp? = green briar, cat briar	H	1	1	0	1 in 1	0
	Iridaceae (Iris family)						
40	Sisyrinchium sp? = blue-eyed grass	N	787 seeds & 239 pods containing 3,533 seeds total seeds 4,320	2	3,193 in 1	1,127 in 2	8.063
	Class B. Dicotyledons (Two cotyledons in embryo)						
	Polygonaceae (Buckwheat family)						
41	Fagopyrum esculentum Moench. = buckwheat	U	89	3	87 in 3	2 in 1	0.223

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total Number of seeds in gizzards	Average number of seeds per crop for the year
42	Polygonum convolvulus L. = wild buckwheat or black bindweed	H	2,972	112	1,402 in 31	1,570 in 107	9.286
43	Polygonum muhlenbergii Wats. = knotweed	H	52	3	11 in 1	41 in 3	0.035
44	Polygonum pennsylvanicum L. = smartweed	H	158	28	25 in 1	133 in 28	0.160
45	Polygonum persicaria L. = lady's thumb	H	85	5	27 in 2	58 in 4	0.269
46	Polygonum sp? = knotweed	H	348	36	16 in 4	332 in 35	0.05
47	Rumex mexicanus Meisn. = willow-leaved dock	H	2	2	0	2 in 2	0
	Chenopodiaceae (Goose-foot family)						
48	Atriplex sp? = saltbush	U	13	1	0	13 in 1	0
49	Chenopodium album L. - lamb's quarters or smooth pigweed	H	31	17	12 in 10	19 in 7	0.057
50	Salsola kali tenuifolia G.F.W.Mey = Russian thistle	H	399	16	363 in 10	36 in 9	2.141
	Amaranthaceae (Amaranth family)						
51	Amaranthus blitoides Wats. = spreading pigweed	H	8	2	3 in 1	5 in 2	0.007
52	Amaranthus retroflexus L. = rough pigweed	H	22	14	11 in 7	11 in 8	0.048
	Caryophyllaceae (Pink family)						
53	Silene noctiflora L. = catchfly	H	3	1	0	3 in 1	0

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
	Ceratophyllaceae (Hornwort family)						
54	Ceratophyllum demersum L. = hornwort	U	26	1	0	26 in 1	0
	Ranunculaceae (Crowfoot family)						
55	Ranunculus sp?=buttercup	N	3	1	0	3 in 1	0
	Cruciferae (Mustard family)						
56	Lepidium apetalum Willd. = peppergrass	H	2	1	2 in 1	0	0.005
	Capparidaceae (Caper family)						
57	Cleome serrulata Pursh. = pink cleome	H	227	2	203 in 2	24 in 1	0.591
58	Polanisia graveolens Kaf. = clammy weed	H	117	1	0	117 in 1	0
	Saxifragaceae (Saxifrage family)						
59	Ribes aureum Pursh. =golden currant or buffalo currant	U	1545 seeds & 13 pods containing 247 seeds; total seeds 1792	1	247 in 1	1,545 in 1	0.588
	Rosaceae (Rose family)						
60	Crataegus sp? = hawthorn	N	11	1	0	11 in 1	0
61	Potentilla monspeliensis L. = cinquefoil	N	54	2	54 in 2	0	0.127

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
62	Prunus americana Marsh = wild plum	U	1	1	0	1 in 1	0
63	Prunus besseyi Bailey = western sand-cherry	U	6	4	0	6 in 4	0
64	Prunus virginiana L. = choke cherry	U	21	3	0	21 in 3	0
65	Prunus sp?	U	72	1	0	72 in 1	0
66	Rosa pratincola Greene = wild rose	N	1,699	116	5 in 2	1,694 in 116	0.021
67	Rubus sp? = bramble	U	205	1	67 in 1	138 in 1	0.159
	Leguminosae (Pulse family)						
68	Astragalus sp? = milk vetch	N	3	3	0	3 in 3	0
69	Glycyrrhiza lepidota Pursh. = wild loquorice	N	2	2	1 in 1	1 in 1	0.006
70	Hosackia americana Piper = Dakota vetch	N	853	46	88 in 7	765 in 46	2.16
71	Legume sp?	?	5	2	4 in 1	1 in 1	0.013
72	Lupinus sp? = lupine	N	4	1	0	4 in 1	0
73	Medicago sativa L = alfalfa	U	16 seeds & 1 pod containing 2 seeds; total seeds 18	9	9 in 5	9 in 5	0.044
74	Melilotus alba Desr. = white-blossom sweet clover	U	704	49	152 in 15	552 in 41	0.629

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
75	Psoralea sp?	N	15	5	2 in 2	13 in 4	0.006
76	Trifolium pratense L. = red clover	U	1	1	0	1 in 1	0
77	Vicia sp? = vetch	U	30	13	2 in 2	28 in 13	0.008
	Linaceae (Flax family)						
78	Linum usitatissimum L. = flax	U	456 seeds & 7 pods containing 189 seeds; total seeds- 645	11	585 in 9	60 in 6	4.198
	Oxalidaceae (Wood sorrel family)						
79	Oxalis stricta L. = wood sorrel)	N	1004	11	720 in 5	284 in 10	3.769
	Geraniaceae (Geranium family)						
80	Geranium dissectum L. = cut-leaved cranesbill	N	7 pods containing 2 seeds	1	2 in 1	0	0.005
	Euphorbiaceae (Spurge family)						
81	Euphorbia sp? = milky spurge	N	12	2	12 in 2	0	0.047
	Anacardiaceae (Cashew family)						
82	Rhus canadensis trilobata Gray = sumach	N	9	1	1 in 1	8 in 1	0.002
83	Rhus sp? = sumach	N	4	1	0	4 in 1	0
	Vitaceae (Vine family)						
84	Vitis vulpina L. = wild grape	U	80	5	1 in 1	79 in 5	0.006

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
	Violaceae (Violet family)						
85	Viola sp? = violet	N	1,526	6	742 in 5	784 in 6	1.777
	Cactaceae (Cactus family)						
86	Mamillaria missouriensis Sweet. = Missouri cactus	H	300 seeds and 2 pods containing 42 seeds; total seeds 342	1	2 in 1	340 in 1	0.004
	Onagraceae (Evening Primrose family)						
87	Gaura coccinea Pursh. = gaura	H	38	4	4 in 1	34 in 4	0.014
	Asclepiadaceae (Milkweed family)						
88	Asclepias sp? = milkweed	N	7	3	4 in 2	3 in 1	0.018
	Convolvulaceae (Convolvulus family)						
89	Convolvulus arvensis L. = field bindweed or creeping jenny	H	94	3	56 in 2	38 in 1	0.395
90	Convolvulus sepium (?) L. = hedge bindweed	H	219	44	0	219 in 44	0
	Polemoniaceae (Polemonium family)						
91	Gilia sp?	N	101	1	0	101 in 1	0

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
	Hydrophyllaceae (Waterleaf family)						
92	Ellisia nyctelea L. = ellisia	N	18	2	3 in 1	15 in 2	0.007
	Boraginaceae (Borage family)						
93	Lithospermum angustifolium Michx. = narrow-leaved puccoon	N	60	15	6 in 3	54 in 14	0.016
	Verbenaceae (Vervain family)						
94	Verbena sp? = vervain	N	22	4	1 in 1	21 in 3	0.003
	Labiatae (Mint family)						
95	Nepeta cataria L. = catnip	N	4	1	0	4 in 1	0
96	Teucrium occidentale Gray = wood sage	N	1	1	0	1 in 1	0
	Solanaceae (Nightshade family)						
97	Physalis sp? = ground cherry	N	185 seeds & 2 pods containing 39 seeds; total seeds-224	4	49 in 2	175 in 3	0.159
98	Solanum nigrum L. = common or black nightshade	H	66 seeds & 2 pods containing 72 seeds; total seeds; 138	2	138 in 2	0	0.454
99	Solanum rostratum=Dunal buffalo bur	H	34	1	3 in 1	31 in 1	0.01

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
100	Solanum triflorum Nutt. = wild tomato	N	921	13	74 in 2	847 in 13	0.263
101	Solanum sp?	?	240	2	0	240 in 2	0
	Plantaginaceae (Plantain family)						
102	Plantago purshii R. & S. = prairie plantain	H	1	1	0	1 in 1	0
	Rubiaceae (Madder family)						
103	Galium sp? = bedstraw	N	2	1	0	2 in 1	0
	Caprifoliaceae (Honeysuckle family)						
104	Symphoricarpos occidentalis Hook = wolfberry	U	1,086 seeds & 957 fruits containing 1,914 seeds; total seeds 3,000	14	1,945 seeds in 2 crops	1,055 seeds in 13	11.577
105	Symphoricarpos sp ?	U	21	2	0	21 in 2	0
	Cucurbitaceae (Gourd family)						
106	Echinocystis lobata L. = wild cucumber	N	1	1	0	1 in 1	0
	Compositae (Composite family)						
107	Ambrosia artemisiifolia L. = little ragweed	H	2,059	45	963 in 16	1,096 in 41	4.172
108	Ambrosia trifida L. = giant ragweed, kinghead	H	104	16	0	104 in 16	0

Numbers assigned to species		Economic classification	Total number of seeds of each species used as food	Total number of birds in which each species was found	Total number of seeds in crops	Total number of seeds in gizzards	Average number of seeds per crop for the year
109	Ambrosia sp? = a ragweed	H	83	2	0	83 in 2	0
110	Arctium minus Bernh. = common burdock	H	1	1	0	1 in 1	0
111	Bidens frondosa L. = beggar tick	H	51	2	14 in 1	37 in 1	0.083
112	Cirsium undulatum Spreng. = prairie thistle	H	6	2	4 in 2	2 in 2	0.011
113	Grindelia squarrosa Dunal.= gumweed	H	4	1	0	4 in 1	0
114	Helianthus sp?,mostly annuus L. = wild sunflower	H	1,930	35	1,026 in 30	904 in 27	3.536
115	Iva xanthifolia Nutt. = marsh elder	N	17	2	14 in 2	3 in 1	0.045
116	Lactuca scariola L. = prickly lettuce	H	1	1	1 in 1	0	0.006
117	Taraxacum officinale Weber = dandelion	H	481	2	385 in 1	96 in 1	0.972
118	Galls	H	10	3	0	10 in 3	0
	Unidentified seeds	?	394	58	94 in 13	300 in 45	0.253

MISCELLANEOUS DATA CONCERNING THE FOOD FOUND IN THE CROPS AND GIZZARDS OF THE PHEASANTS EXAMINED IN THIS INVESTIGATION

The length of time that food remains in the crop and gizzard of a pheasant has not been determined. The crop is mainly a storage organ and, while it softens the food considerably, it has little function in digesting it. Consequently, the food, be it soft or hard, that is obtained for examination from this part of the food tube, is ordinarily not broken up or digested and is readily identifiable in most cases. The gizzard, however, has as its main purpose that of reducing the food to fine bits. Naturally, the food that is obtained from this part of the food tube is much more difficult to identify and some of it may be beyond identification. The degree to which the food is broken up in the gizzard will depend upon a number of conditions, the most important of which are the following:

1. the degree of hardness and brittleness of the food:
2. the size of the food particles when eaten:
3. the length of time the food has been in the gizzard, and
4. the amount of hard grinding material, such as stones, in the gizzard.

Soft food, such as the bodies of caterpillars, is ground into small bits in the gizzard in a very short space of time, and shortly thereafter it is passed on into the intestine. The harder food, however, such as hard seeds, heads and legs of many insects, elytra or wing covers of beetles or portions of these, mandibles of chewing insects, etc., may remain in the gizzard for varying periods of time. Some of this material may be passed on into the intestine shortly after it has been ground fine enough, but some of it may remain in the gizzard for many weeks, even tho it has been reduced to a very fine state. Again, some of the harder and smaller food materials may escape the grinding action of the gizzard for a considerable time and such particles are sometimes retained in the gizzard for an indefinite period. That this is true may be noted from the large number of small mandibles of beetles, ants, and other insects which were found in the gizzards of some of our pheasants that were shot in the middle of the winter. It is true that pheasants may pick up and swallow dead insects whenever they find such food, but this material is not sufficiently abundant in the winter time to account for the large number of small mandibles in the gizzards of so many pheasants at this time of year. The conclusion must be drawn, therefore, that both hard and soft foods remain in the crop for only a comparatively short time. In the gizzard, the soft food, as soon as it is broken down, passes on into the intestine. The hard food remains in the gizzard for a longer period of time, usually until it has been ground up into small particles, but some of the finer particles may remain in the gizzard indefinitely.

It seems that the pheasant has two principal feeding periods during the day. The first occurs early in the morning, while the second takes place in the afternoon. In addition, the bird may pick up articles of food between these principal feeding periods. In a sense, therefore, the pheasant takes two principal meals per day, altho it is true that we may not set a definite time when the first meal ends and the second begins.

Because the crop is emptied rather regularly and because the gizzard may retain some of its food for weeks at a time, evidently it would be incorrect to state that the contents of the crop and gizzard together represents one particular morning meal, afternoon meal or both. The crop contents alone come closer to representing a meal, and especially is this true if the bird is shot shortly after one of its principal feeding periods.

For the same reasons one can get more accurate data concerning the quantities of the various kinds of food that are eaten by pheasants during a meal if the crop contents instead of the gizzard contents of a large number of birds are examined. On the other hand, the list of foods eaten by pheasants is materially increased when the investigator examines the contents of both crop and gizzard of all of his birds.

TABLE 4. - Time of day when the pheasants used in this investigation were shot.

A. M.						
Time	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12
Number of Pheasants	1	3	4	10	9	3

P. M.									
Time	12 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9
Number of Pheasants	0	7	9	19	50	50	60	40	8

The pheasants that were shot for this investigation were killed between the hours of 6 A.M. and 9 P.M. In table 4 we have indicated the hours during which the pheasants were shot and also the number of birds that were killed during each hour. It will be noted that from 6 A.M. to 11:59 A.M. only 30 birds were killed, while 243 pheasants were taken from 12 M. to 8:59 P.M. Only 273 pheasants are accounted for in the above table, while the investigation is based upon 285 birds. The difference between 285 and 273, or 12 birds is accounted for thru the fact

that these 12 pheasants were found dead. Most of these birds were picked up on highways, and it is believed that they were killed by automobiles. The twelve birds not included in table 4 are the following: (by number)

118 - 126 - 127 - 129 - 139 - 260 - 270 - 275 - 279

354 - 367 - 501

From the data derived from this investigation, table 5 was prepared. In this table we have indicated by months, the number of pheasant crops which contained or which did not contain animal food. There also is indicated the total number of pheasant crops which were received by us during each month and the percentage of the crops by months which enclosed or which did not enclose animal food. Table 6 contains information similar to that of table 5 but in this case the animal contents of the gizzards were used from which to prepare the table instead of the animal contents of the crop. When tables five and six were prepared, no attempt was made to differentiate between animal food that was probably alive when eaten by the pheasants and animal food that was probably dead when picked up.

From table 5, it is apparent that a comparatively small number of pheasants had animal food in their crops during the months of January, February and December. This is what one would expect, for during these cold months, little or no live animal food is available for the pheasants. The small amount of animal food found in the crops of our pheasants during these months consisted chiefly of grasshoppers that were dead when picked up, or portions of the bodies or legs of such grasshoppers.

It is of interest to note that 131 of the 285 pheasants which we examined had no animal food in their crops, while 154 crops contained animal food. If we eliminate from consideration the birds shot during January, February and December and consider only the remainder, we find that 148 of such pheasants contained animal food in their crops, while 99 did not. In other words, during the cold months of December, January and February, six birds out of every 38, or slightly less than 14 per cent, had animal food in their crops, while during the remainder of the year 16 pheasants out of every 27, or slightly less than 60 per cent had animal food in their crops.

If tables five and six are compared, it will be noted that it was in the cold months of January, February and December when the smallest percentages of crops and gizzards contained animal food. This is what one can logically expect. However, the percentage of gizzards that contained animal food was very much higher in any one month than was the percentage of crops that contained animal food for the same month. This can readily be accounted for when we remember that the foods in general, and particularly the harder materials, remain in the gizzard for a longer period of time than they do in the crop.

TABLE 5 - Number of pheasant crops which were examined during each month, number of crops and percentage of crops by months that contained animal food and number of crops and percentage of crops which did not include animal food.

Months	Total number of crops examined	Total number of crops containing animal food	Percentage of crops containing animal food	Total number of crops not containing animal food	Percentage of crops not containing animal food
January	14	3	21 +	11	79 -
February	14	2	14 +	12	86 -
March	13	6	46 +	7	54 -
April	34	20	59 -	14	41 +
May	38	23	61 -	15	39 +
June	33	18	55 -	15	45 +
July	35	20	57 +	15	43 -
August	34	22	65 -	12	35 +
September	24	20	83 +	4	17 -
October	26	14	54 -	12	46 +
November	10	5	50	5	50
December	10	1	10	9	90
TOTAL	285	154		131	

Only 34 of the 285 pheasant crops which were sent us lacked vegetable matter in their crop contents, while the remainder of the crops or 251 did contain such matter (Fig.7). On the other hand, in marked contrast to this, 131 crops of those examined lacked animal food, while 154 contained such food (Fig.5). The conclusion apparently may be drawn that pheasants will eat a large variety of animal and vegetable matter if it is available. When animal matter becomes scarce or not available for pheasants, then such matter is found in small quantities in the crops or it is lacking entirely. Animal food of pheasants varies more during the year than does the plant food so far as quantity and availability is concerned, a state of affairs that fits in nicely with the facts mentioned heretofore.

Of the 34 pheasant crops which lacked vegetable food, 32 also lacked animal food. Those crops lacking vegetable food were distributed by months thru the year as follows:

January	2 birds	July	5 birds
February	3 "	August	5 "
March	3 "	September	0 "
April	3 "	October	5 "
May	2 "	November	1 "
June	4 "	December	1 "

T O T A L 34 birds

TABLE 6-Number of pheasant gizzards which were examined during each month, number of gizzards and percentage of gizzards by months that contained animal food and number of gizzards and percentage of gizzards that did not include animal food.

Months	Total number of gizzards examined	Total number of gizzards containing animal food	Percentage of gizzards containing animal food	Total number of gizzards not containing animal food	Percentage of gizzards not containing animal food
January	14	6	43 -	8	57 +
*February	13	7	54 -	6	46 +
March	13	12	92 +	1	8 -
April	34	31	91 +	3	9 -
May	38	37	97 +	1	3 -
June	33	33	100	0	0
July	35	35	100	0	0
August	34	33	97 +	1	3 -
September	24	23	96 -	1	4 +
October	26	26	100	0	0
November	10	7	70	3	30
December	10	3	30	7	70
TOTAL	284	253		31	

*Bird 141 shot in February. Shipment did not include gizzard.

TABLE 7.-Number of pheasant crops which were examined during each month, number of crops and percentage of crops by months that contained vegetable food and number of crops and percentage of crops that did not contain vegetable food.

Months	Total number of crops examined	Total number of crops containing vegetable food	Percentage of crops containing vegetable food	Total number of crops not containing vegetable food	Percentage of crops not containing vegetable food
January	14	12	86 -	2	14 +
February	14	11	79 -	3	21 +
March	13	10	77 -	3	23 +
April	34	31	91 +	3	9 -
May	38	36	95 -	2	5 +
June	33	29	88 -	4	12 +
July	35	30	86 -	5	14 +
August	34	29	85 +	5	15 -
September	24	24	100	0	0
October	26	21	81 -	5	19 +
November	10	9	90	1	10
December	10	9	90	1	10
TOTAL	285	251		34	

It will be noted that the distribution by months of the birds that lacked vegetable food in their crops was fairly uniform thruout the year. The same was also true for the 32 birds whose crops lacked both animal and vegetable foods.

Of the pheasant gizzards which we examined during the course of this project, only 31 lacked animal food (Table 6). Twenty-one of these birds were shot during January, February and December, the months during which animal food is scarce. Thirty of the 31 birds whose gizzards lacked animal food did not have any animal food in their crops.

Not a single gizzard of all those examined during this investigation lacked vegetable material. This was not surprising to us, for vegetable matter is available to pheasants at all times of the year and during the colder months is practically the only type of food available.

Every gizzard whose contents of food we examined contained vegetable matter, regardless of whether the pheasants were shot in the morning or afternoon. There is no evidence from the data available from our investigation that would lead one to believe that a larger or smaller percentage of pheasants will have animal food in the crop when such pheasants are shot in the forenoon as compared with another lot shot in the afternoon. The same may be said of vegetable food in the crop and animal food in the gizzard.

No pheasant contained specimens of all the animal and plant species used as food by our entire lot of pheasants.

In table 3 there is indicated the total number of each species of seed found in the crops and gizzards of our pheasants, also the total number of birds in which each species of seed was found. Similar information is given for the animal food found in the crops and gizzards, but only such species of animals are listed as occurred in an unbroken or only slightly broken condition in the food tube. Each species of animal or seed listed in table 3 is recorded under its scientific name and the common name is also given whenever such a name is available. Further, the seeds and animals listed are arranged according to their blood relationships, those of a particular family being grouped under its proper family name. Each species of animal and each species of seed is given an economic classification and finally, in order that we might avoid the necessity of repeating again and again the scientific names of the animals and plants in the latter half of this bulletin, we have assigned a number to each species of animal or plant in this table.

In table 3 we have not recorded the occurrence in the food tubes of any heads, legs, wings, abdomens or any other body parts of any species of animal used as food by the pheasants, even tho many of such body fragments were identified. Most of

such fragments were found in the gizzards and were those of insects. Undoubtedly most of these insects had been picked up when the insects were alive and unbroken, but when they passed into the gizzard, they sooner or later became broken up into fragments. At times, the crops contained legs of grasshoppers or other body parts of insects. Such body fragments were undoubtedly picked up as such by the pheasants, for the crop does not ordinarily break up the bodies of insects.

The following data may be of interest to the reader, for we have enumerated here the plant and animal matter most frequently consumed by our pheasants and in addition, we have indicated the number of birds in whose crops or gizzards, or crops and gizzards a particular food material was found.

Seeds of green foxtail occurred in the crops or gizzards, or crops and gizzards of 140 pheasants.

Seeds of yellow foxtail occurred in the crops or gizzards, or crops and gizzards of 140 pheasants.

Seeds of corn occurred in the crops or gizzards, or crops and gizzards of 126 pheasants.

Seeds of wild rose occurred in the crops or gizzards, or crops and gizzards of 116 pheasants.

Seeds of barley occurred in the crops or gizzards, or crops and gizzards of 114 pheasants.

Seeds of wild buckwheat occurred in the crops or gizzards, or crops and gizzards of 112 pheasants.

Seeds of wheat occurred in the crops or gizzards, or crops and gizzards of 106 pheasants.

Seeds of oats occurred in the crops or gizzards, or crops and gizzards of 88 pheasants.

Seeds of Dakota vetch occurred in the crops or gizzards, or crops and gizzards of 46 pheasants.

Seeds of white blossomed sweet clover occurred in the crops or gizzards, or crops and gizzards of 49 pheasants.

Seeds of little ragweed occurred in the crops or gizzards, or crops and gizzards of 45 pheasants.

Seeds of hedge bindweed occurred in the crops or gizzards, or crops and gizzards of 44 pheasants.

Seeds of wild sunflower occurred in the crops or gizzards, or crops and gizzards of 35 pheasants.

March flies and their larvae occurred in the crops or gizzards, or crops and gizzards of 61 pheasants.

Grasshoppers (M. femur-rubrum) occurred in the crops or gizzards, or crops and gizzards of 36 pheasants.

Cutworms sp? occurred in the crops or gizzards, or crops and gizzards of 30 pheasants.

Black field crickets occurred in the crops or gizzards, or crops and gizzards of 26 pheasants.

It may be noted from table 3 that the variety of plant food eaten is not nearly as large as is the animal food that is consumed. This is to be expected, for insect species alone outnumber greatly the plant species in our state. The variety of food that is eaten by a pheasant will naturally depend upon the food that is available in the area in which the pheasant is feeding. Where only a small number of species of plants and insects are available, only a small number of food items may be found in the crops and gizzards of the birds, but where a large number of species of plants and insects are at hand, it is possible that a larger assortment of food will be found in the crops and gizzards of the feeding pheasants. It should be remembered that a pheasant, while feeding, may move from one ecological area into others, thus making it possible for the same bird to pick up a large variety of food. From our data, it is apparent that a greater variety of food is eaten by pheasants in the fall, summer and spring months, on an average, than is consumed during the winter months. While the number of different food items in the crop and gizzard of a pheasant may total as high as 50, this is unusual. Most of our pheasants had a total of 10 to 20 different foods in their crops and gizzards, while a large percentage had as small a number as 6 to 10 different foods.

The following data may interest the reader, because we have listed here the bird which contained the largest numbers of seeds or insects of a particular kind in its crop. We have also stated the month in which the pheasant was shot and the county in which it was taken.

Corn: Bird 277, shot January 20, 1930 in Hamlin County. There were 230 kernels of corn in the crop.

Wheat: Bird 73, shot October 12, 1929 in Marshall County. There were 915 kernels of wheat in the crop.

Barley: Bird 253, shot April 25, 1929 in Codington County. There were 932 kernels of barley in the crop.

Oats: Bird 7, shot January 15, 1930, in Butte County. There were 770 kernels of oats in the crop. The bird was shot while it was working in oat chaff near an oat straw stack.

Rye: Bird 364, shot August 14, 1930 in Lake County. There were 313 kernels of rye in the crop.

Green foxtail: Bird 476, shot October 13, 1929 in Aurora County. There were 1536 seeds of green foxtail in the crop.

Yellow foxtail: Bird 452, shot April 11, 1930 in Davison County. There were 1532 seeds of yellow foxtail in the crop.

Wild sunflower: Bird 477, shot October 20, 1929 in Aurora County. There were 322 seeds of wild sunflower in the crop.

Wild buckwheat: Bird 438, shot February 19, 1930 in Hutchinson County. There were 717 seeds of wild buckwheat in the crop.

Wild oats: Bird 28, shot June 24, 1929 in Custer County. There were 687 seeds of wild oats in the crop.

Little ragweed: Bird 33, shot in Fall River County, September 14, 1929. There were 406 seeds of little ragweed in the crop.

Cutworms sp? Bird 60, shot in Beadle County, May 31, 1929. There were 38 entire cutworms in the crop and 25 in the gizzard.

Grasshoppers: 5 species with 92 Melanoplus femur rubrum. Bird 33, shot in Fall River County, September 14, 1929. There were 103 grasshoppers in the crop of this bird.

Crickets: 2 species, numbers 110 and 111. Bird 327, shot in Hamlin County, October 22, 1929. There were 3 black field crickets and 112 Neobius crickets in the crop. In the gizzard there were 8 Nemobius crickets. In addition, the crop and gizzard contained a large amount of broken up body parts of these crickets.

A CONSIDERATION OF THE PLANT FOOD EATEN BY PHEASANTS IN SOUTH DAKOTA

The pheasants whose crop and gizzard contents we examined had eaten not only the seeds of many spermatophytes or flowering plants, but they had also devoured portions of leaves, stems, roots and fruits of some of these plants. Two pheasants had eaten 7 sporocarps of water fern, while three of the birds had eaten a total of 10 plant galls. However, the bulk of the plant food that was consumed consisted of seeds, for an enormous total of 140,219 seeds were found in the crops and gizzards of our 285 pheasants. This averages slightly less than 492 seeds per bird. The seeds consumed by the 285 birds are grouped according to their economic importance in table 8.

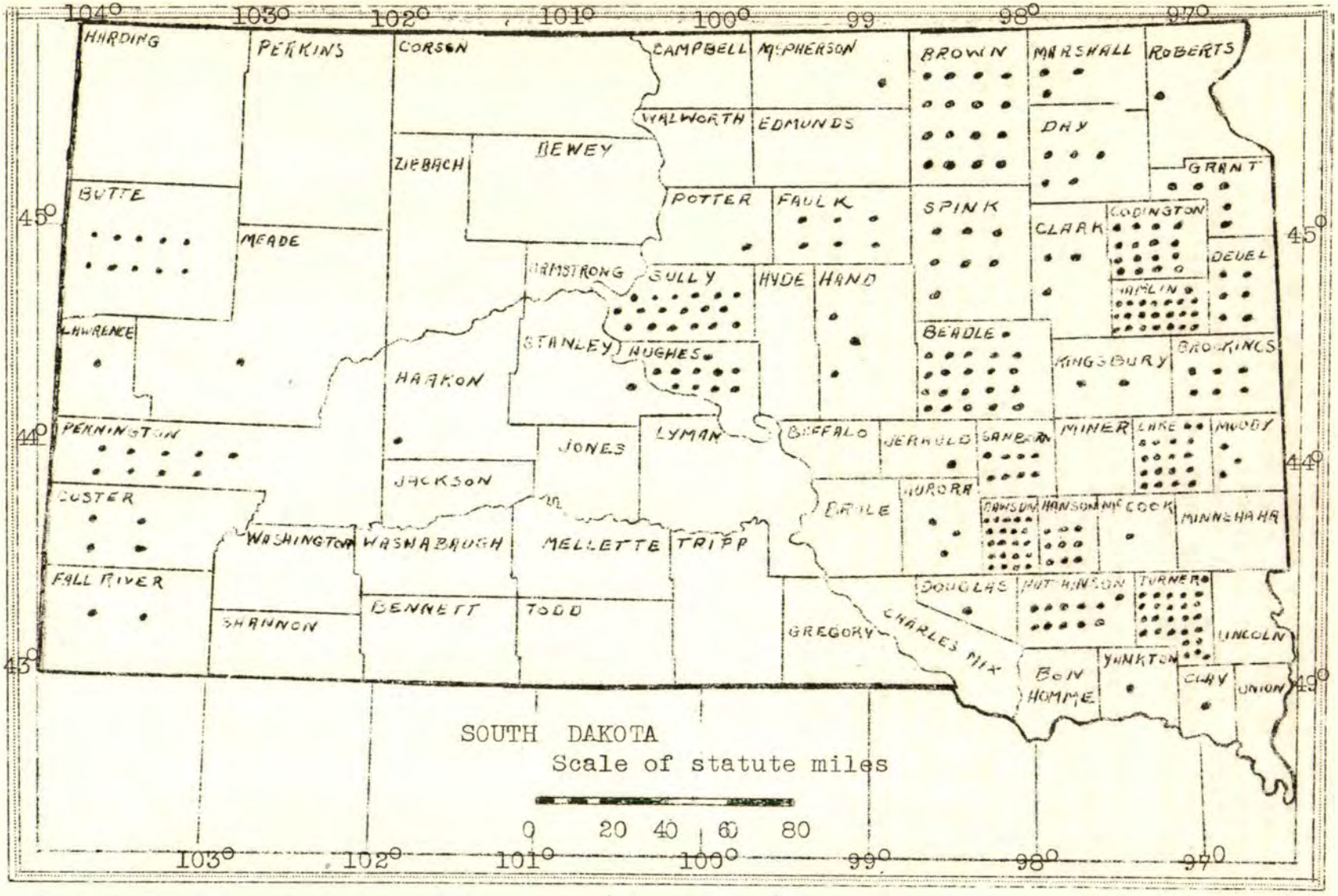
TABLE 8.-Economic grouping of seeds consumed by 285 pheasants in South Dakota.

	Number of species of plants	Total number of seeds	Total number of occurrences of species of seeds in crops and gizzards
Seeds of useful species of plants	35	35,968	599
Seeds of neutral species of plants	38	48,861	318
Seeds of harmful species of plants	40	54,717	746
Seeds of plants with questionable economic status	3	279	6
Unidentifiable seeds	?	394	58

The plants whose seeds were found in the food tubes of the pheasants totaled 116 species. These species were divided among 51 plant families (Table 3). The bulk of the seeds eaten were included in the grass family (Gramineae), while seeds of Compositae (composite family), Polygonaceae (buckwheat family), Rosaceae (rose family), Leguminosae (pulse family), Solanaceae (nightshade family), Violaceae (violet family) and Caperifoliaceae (honeysuckle family), made up most of the remainder.

Corn, wheat, barley, oats and rye, in the order named, are the cultivated crops whose seeds were eaten most abundantly by the pheasants. In addition, the pheasants had eaten the seeds of many other useful and cultivated crops such as alfalfa, buckwheat, flax, millet, red clover sorghum and sweet clover, but these seeds were taken in such small quantities that we are not warranted in discussing them further.

Green and yellow foxtail, wild buckwheat or black bindweed, wild sunflower, little ragweed, wild oats, dandelion, barnyard grass, Russian thistle, knotweed and Missouri cactus are the weeds whose seeds were eaten most abundantly by the pheasants. However, seeds of the following weeds were also found in the crops and gizzards of the pheasants that we examined, but the total number of these seeds averaged less than one seed per bird: black nightshade, field bindweed or creeping jenny, giant ragweed, hedge bindweed, marshelder, pepper grass, pink cleome, rough pigweed, smartweed, and squirrel-tail grass or wild barley. Because the seeds of the last mentioned group of weeds were used so sparingly as food by the pheasants, they will not be considered further in this publication.

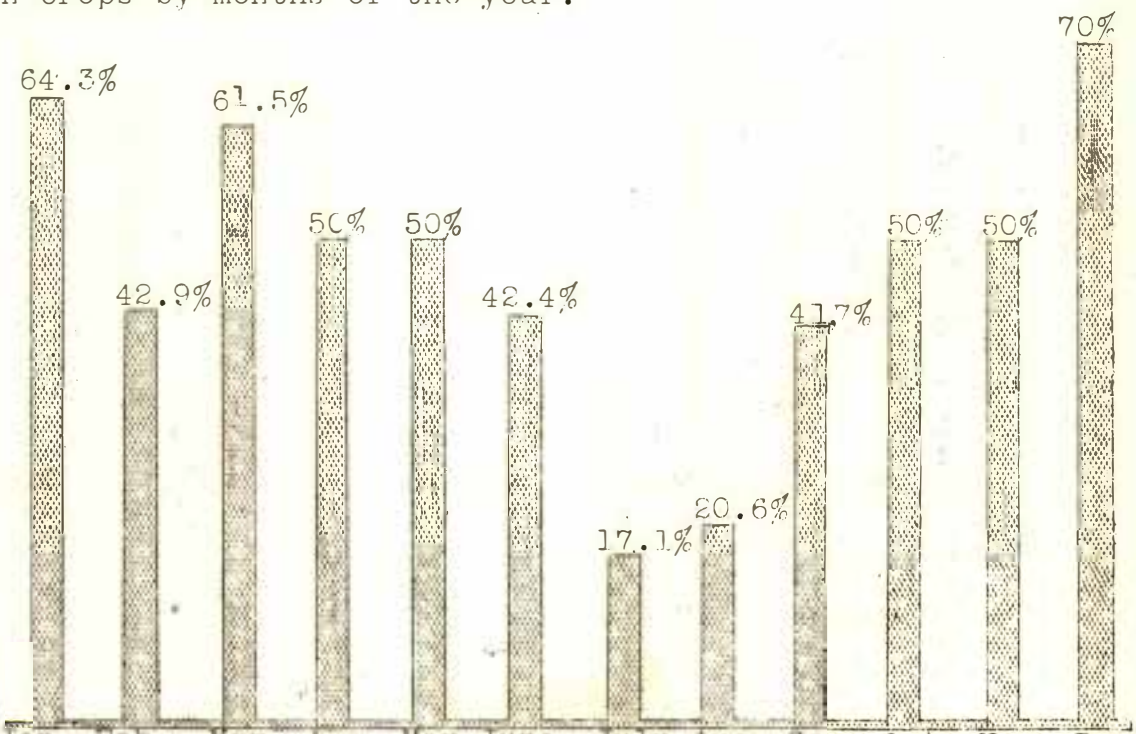


Map showing counties in which pheasants were shot for examination. Each dot represents one bird.

Figure 1

Corn is undoubtedly the most important sirgle food item in the diet of the pheasant in South Dakota. A total of 4,430 unbroken kernels of corn were found in the crops and gizzards of the 285 pheasants which we examined. This does not include that corn in the gizzard which was broken up into coarse or fine bits. If we wish to consider the contents of the crops only, with the idea that this represents more nearly a single meal of the pheasants, then we find that the 285 pheasants had 4114 kernels of corn in this compartment of their food tubes. To compute the average number of grains of corn per pheasant crop, one would ordinarily suppose that the proper procedure to follow would be to divide the total number of grains found in all of the crops by the total number of crops. However, such a procedure would result in erroneous figures, first, because the total number of crops sent us were not identical for each month of the year, and second, because the amount of corn in the crops varied greatly from month to month. Because of these facts, we found it necessary to compute the average number of kernels of corn in each crop for each month of the year and following this, to compute the yearly average from the monthly averages.

Graph showing percentage of pheasants that contained corn in crops by months of the year.



*1.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
*2.	14	14	13	34	38	33	35	34	24	26	10	10
*3.	9	6	8	17	19	14	6	7	10	13	5	7

* 1. Month *2. No. of birds examined *3. Occurrences of corn

Figure 2

Of the entire lot of birds examined, 121 had corn in their crops. During each of 10 months, more than 40 per cent of the pheasants examined had corn in their crops (Fig.2), but in July and August, the other two months of the year, these figures dropped to 17.1 and 20.6 per cent respectively.

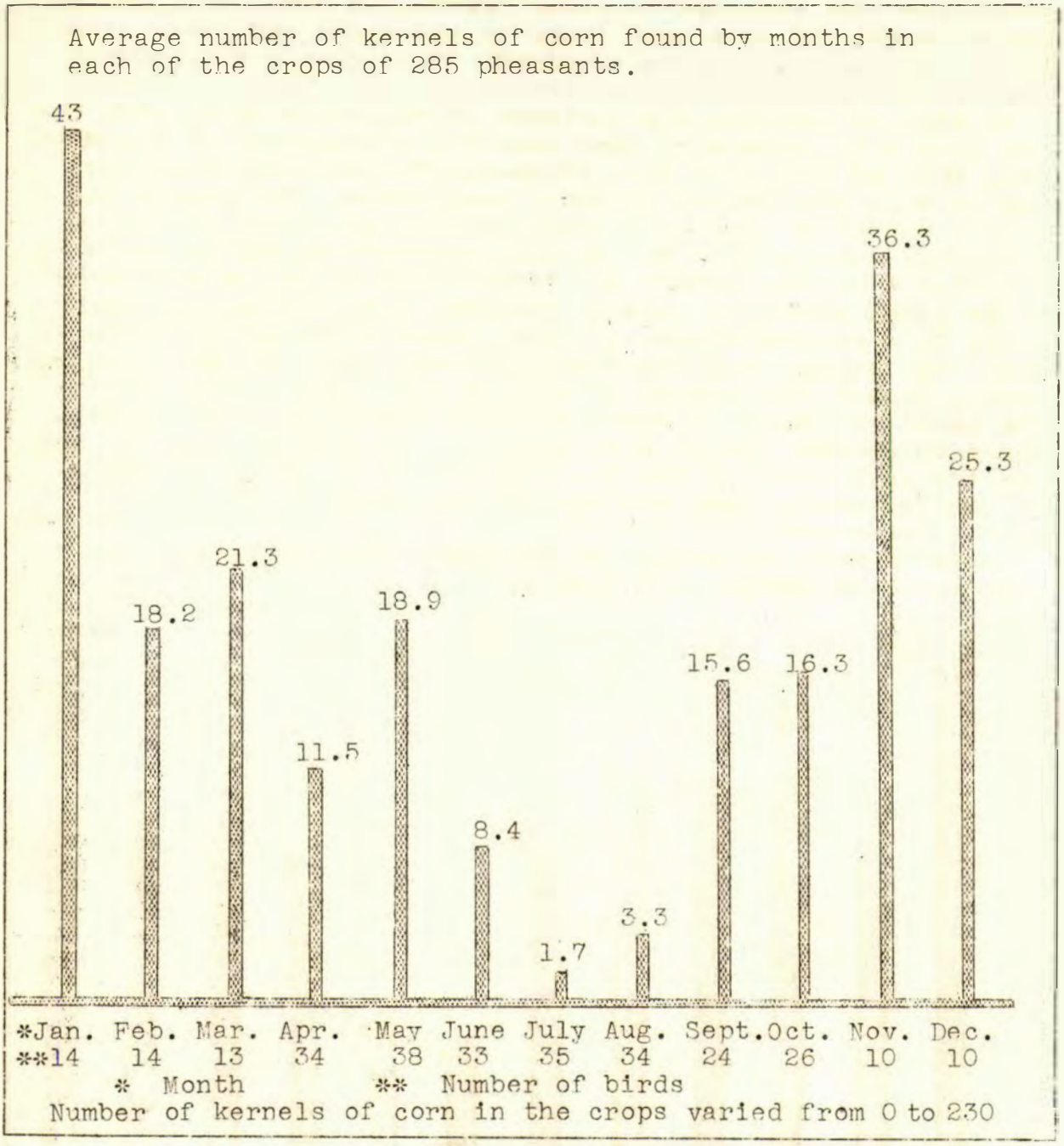


Figure 3

The average number of kernels of corn in each crop of the 14 pheasants examined during January was 43 (Fig.3). For November and December, the next highest ranking months, the average number of kernels of corn in each crop was 36.3 and 25.3 respectively,

while for the year the average number of kernels per crop was 18 and a slight fraction. If figures two and three are compared, it will be noted that July and August give us smaller values than any other months. In other words, it would seem that a smaller number of birds eat corn during July and August than during any other month of the year, and further, those birds that do eat corn, eat less of it during July and August than during any other months of the year. Undoubtedly, the main reasons why pheasants eat less corn during June, July and August is because there is less of the corn available and because other foods such as insects are more abundant.

Graphs two and three deviate somewhat from what should be expected during the months of February, April, September, October and November. Some of the unexpected results may be charged to the fact that we did not have a sufficient number of pheasant crops to examine and second, during a portion of the winter in some sections of the state, snow covered the ground, a condition which would make it more difficult for pheasants to find the corn.

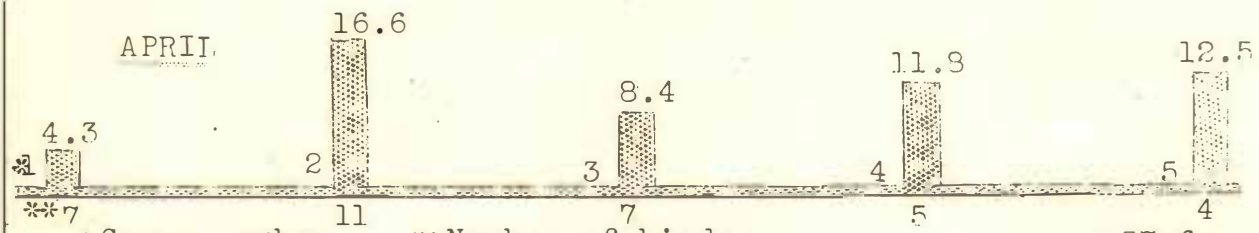
In figure four we have arranged the counties from which we obtained pheasants into five groups. The grouping was based on the percentage of each county area that was devoted to corn production. In group one was placed all counties that had 0.005 to 0.081 per cent of their total land area in corn. In group two the percentage varied from 0.104 to 0.156. In group three it ranged from 0.178 to 0.245 per cert. In group four it varied from 0.271 to 0.297 per cent, while in group five it ranged from 0.355 to 0.432 per cent. One would naturally expect that since group five had the largest percentage of its land area in corn, that in this group of counties, corn would be available to the pheasant in the greatest quantity. Further, one would expect to find a larger percentage of pheasants eating corn in group five than in any other group. In addition, we would also expect these pheasants to have the largest numbers of kernels of corn in their crops on an average. The graphs in figure four show the average amount of corn found in the crops of each pheasant obtained from the five groups of counties during April, May, June and July. The only graph which meets our expectancy is the one for the month of June. The reason we can offer for the unexpected findings which are expressed in the graphs for April, May and July, is that the investigation is based upon too small a number of pheasants. That this is probably true may be noted in the May graph. In this graph one bird alone in group one ate 116 kernels of corn. Since we had only five pheasants to examine for this group of counties during May, naturally the average amount of corn eaten by the pheasants of this group was abnormally high.

Figure 4

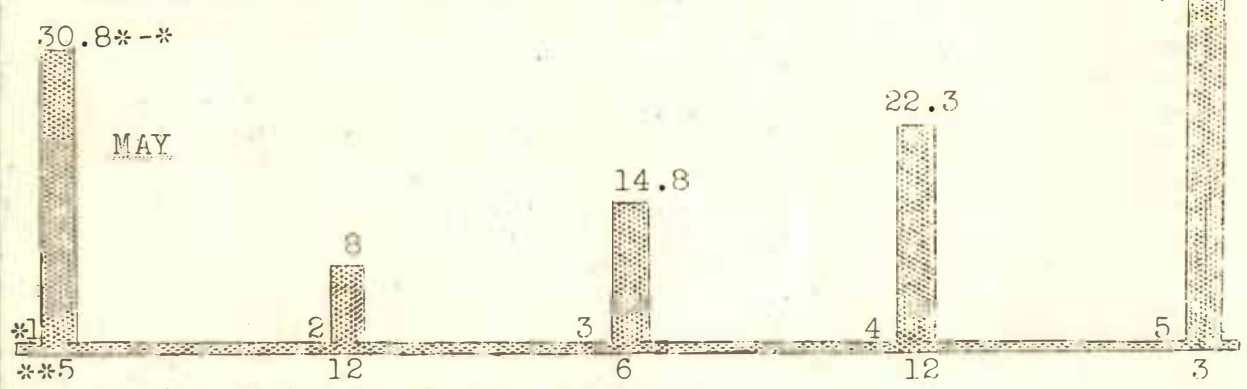
Counties arranged in groups based on percentage of the county area in corn.

GROUP I .005-.081 %	GROUP II .104-.156 %	GROUP III .178-.245%	GROUP IV .271- .297 %	GROUP V .355- .432%
1. Lawrence	13. Faulk	25. Beadle	31. Lake	38. Yankton
2. Butte	14. Potter	26. Jerauld	32. Hanson	39. Turner
3. Stanley	15. Deuel	27. Aurora	33. Hutchinson	40. Clay
4. Custer	16. Grant	28. Kingsbury	34. Davison	
5. Pennington	17. Sully	29. Brookings	35. Moody	
6. Meade	18. Roberts	30. Sanborn	36. Douglas	
7. Haakon	19. Brown		37. McCook	
8. Fall River	20. Hand			
9. McPherson	21. Spink			
10. Marshall	22. Clark			
11. Day	23. Hamlin			
12. Codington	24. Hughes			

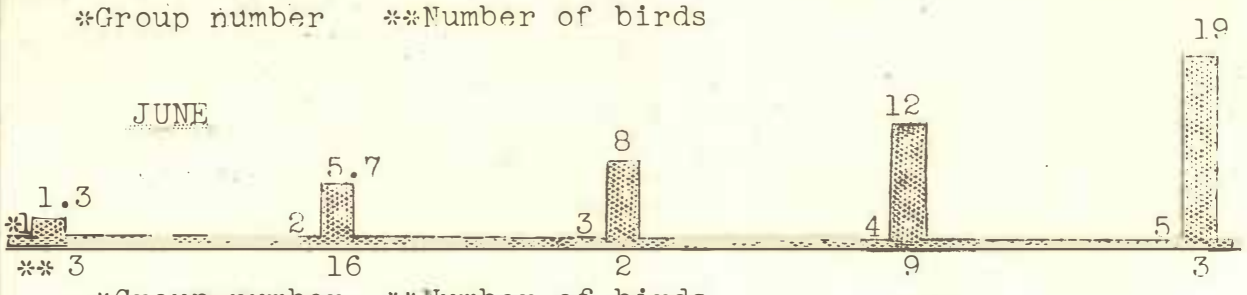
Graphs showing average amount of corn found in each crop of the pheasants obtained from the five groups of counties during APRIL, MAY, JUNE and JULY



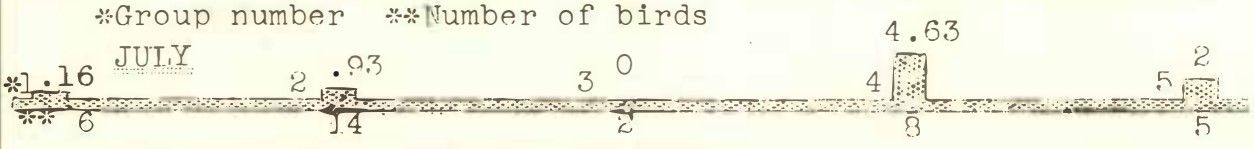
*Group number **Number of birds



*Group number **Number of birds



*Group number **Number of birds



*group number **Number of birds

*-*One bird ate 116 out of 154 kernels.

DOES THE PHEASANT PULL SPROUTED CORN AND DOES IT PECK UP PLANTED CORN?

Reliable complaints have come to us from farmers and others that pheasants, at times, do pull off young corn sprouts and either discard or eat them, and that pheasants, at times, do peck up and eat planted corn that has or has not germinated. The data presented in this bulletin is the result of a laboratory study and is not based on a field study of the pheasants, for neither the writer nor his assistants were furnished funds for this purpose. Under what conditions pheasants may injure corn as discussed above we have no way of knowing.

However, a special attempt was made to learn, if possible, how common the habits had become among our pheasants of pecking up and devouring planted corn and of pulling and devouring germinated corn. Accordingly, word was sent the deputy game wardens to shoot a large number of pheasants during May and June. As a consequence, we received the crops and gizzards of 71 pheasants during these two months. A total of 949 kernels of corn were found in these pheasants, but only 4 kernels were definitely sprouted and 26 were questionably sprouted. We found no young corn sprouts nor corn leaves whatsoever in the crops or gizzards.

It is claimed by a few observers that an occasional pheasant has been observed to follow up a row of young corn plants and as it came to the hills of young plants it would reach down and break off the plants and discard them. Whether this is actually true or not the writer has no way of knowing.

A. C. Maxson (3) after studying the pheasant near Longmont, Colorado, writes as follows regarding the feeding habits of the birds:

"The corn pulling habit of this bird results in quite heavy damage where this crop is grown and the birds are numerous. Sugar beets in all stages of development and the roots set out for seed production are damaged to quite an extent, specially near nesting grounds.

"It has been noticed that the greatest damage has occurred near alfalfa fields and waste ground which is covered with a heavy growth of weeds. Such places afford concealment during the day and furnish protected nesting places."

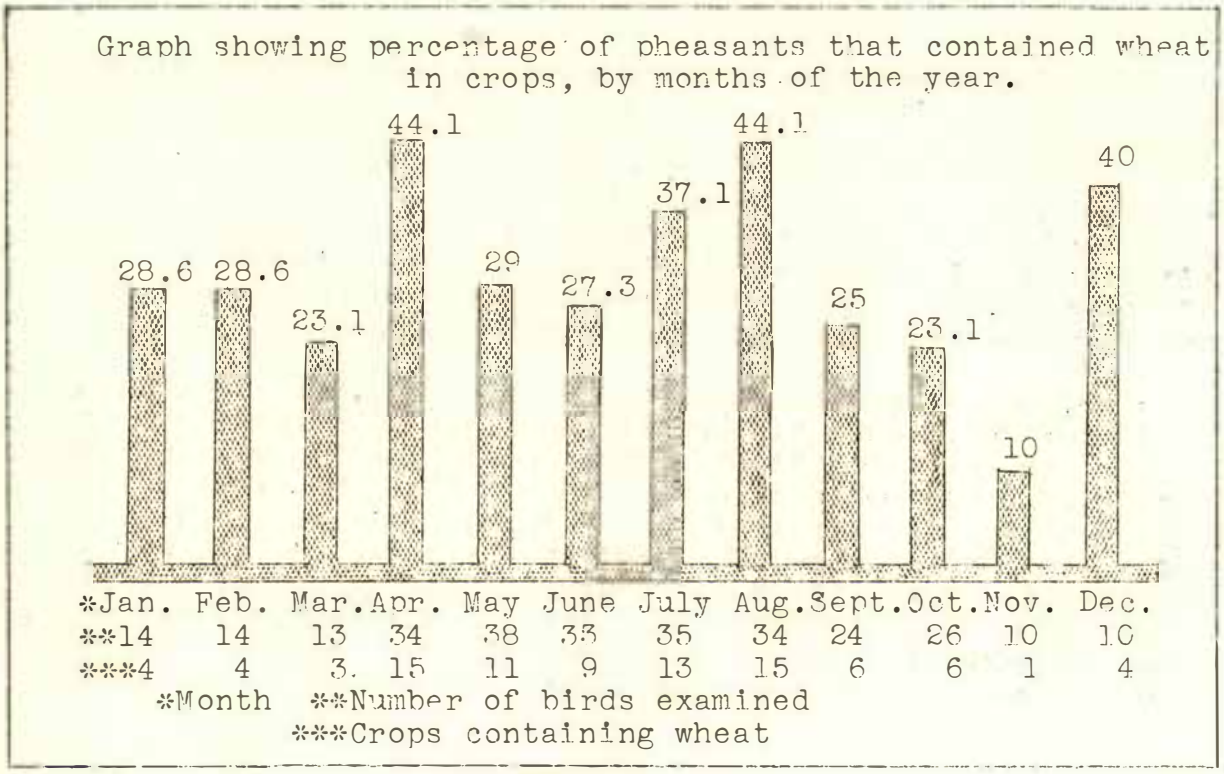


Figure 5

It is also claimed by a few observers that some pheasants may peck up a considerable amount of recently planted corn, especially if it is not planted deep enough. Again in this case we are in no position to deny or corroborate the observation.

M. H. Swenk (10) Head of the Department of Entomology, University of Nebraska writes as follows regarding the feeding activity of the pheasant in corn fields in central Nebraska: "It will be observed that corn consumption declined from over 80 per cent of the month's food in April to less than 65 per cent in May, and that it reached its lowest point in June. This fact indicates that the pulling of newly sprouted corn is not so attractive a method of securing that grain as is the picking up of waste kernels. Also, the corn found in the May and June crops was mostly unsprouted. Nevertheless, there is plenty of good evidence that the pheasant does pull newly sprouted corn. Mr. Kovanda saw cock pheasants pulling corn on two separate occasions in May 1929. They would pass up several plants, then suddenly jerk one off. The one jerked off often had an insect burrow near it . . . . Several cock pheasants were seen scratching out corn. The hen pheasants apparently preferred lister rows where they could hide and find the corn more easily. They were not common in checked corn."

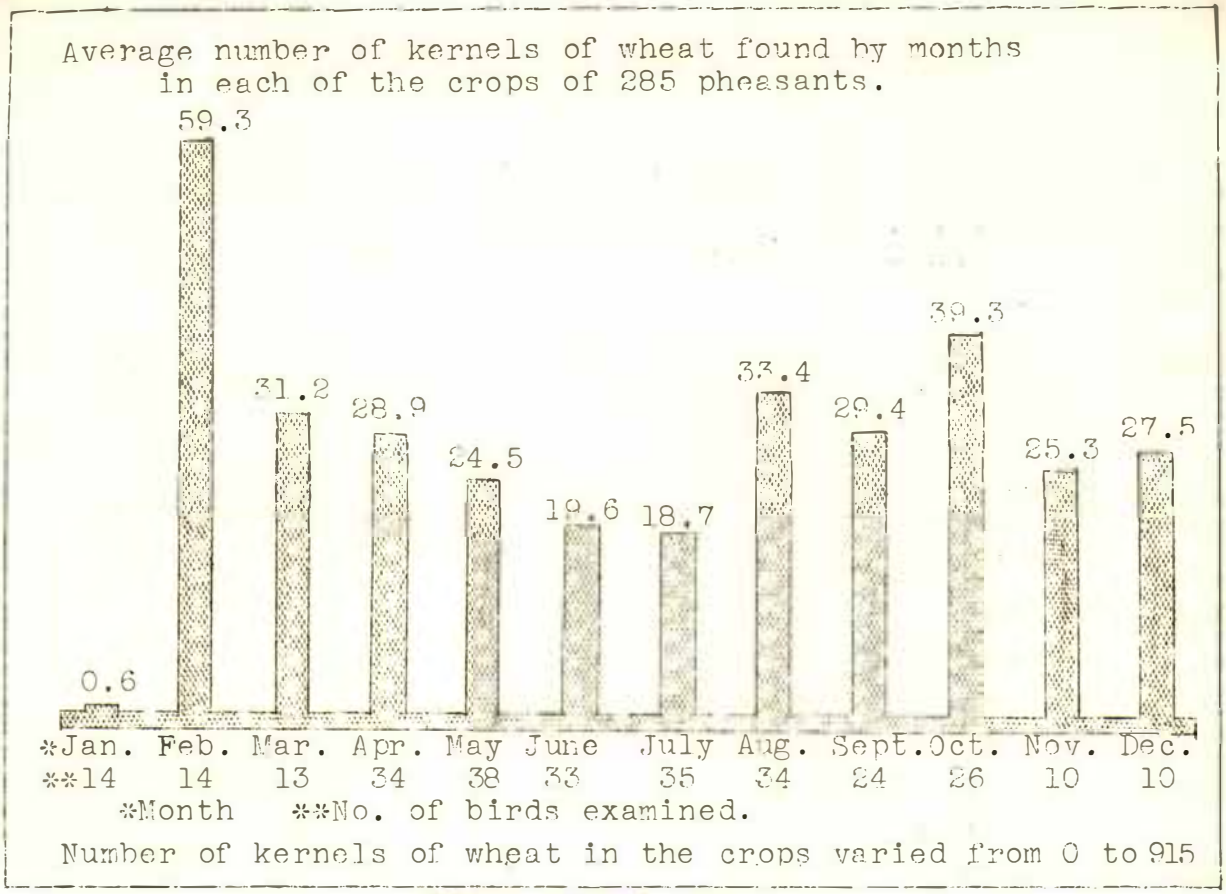


Figure 6

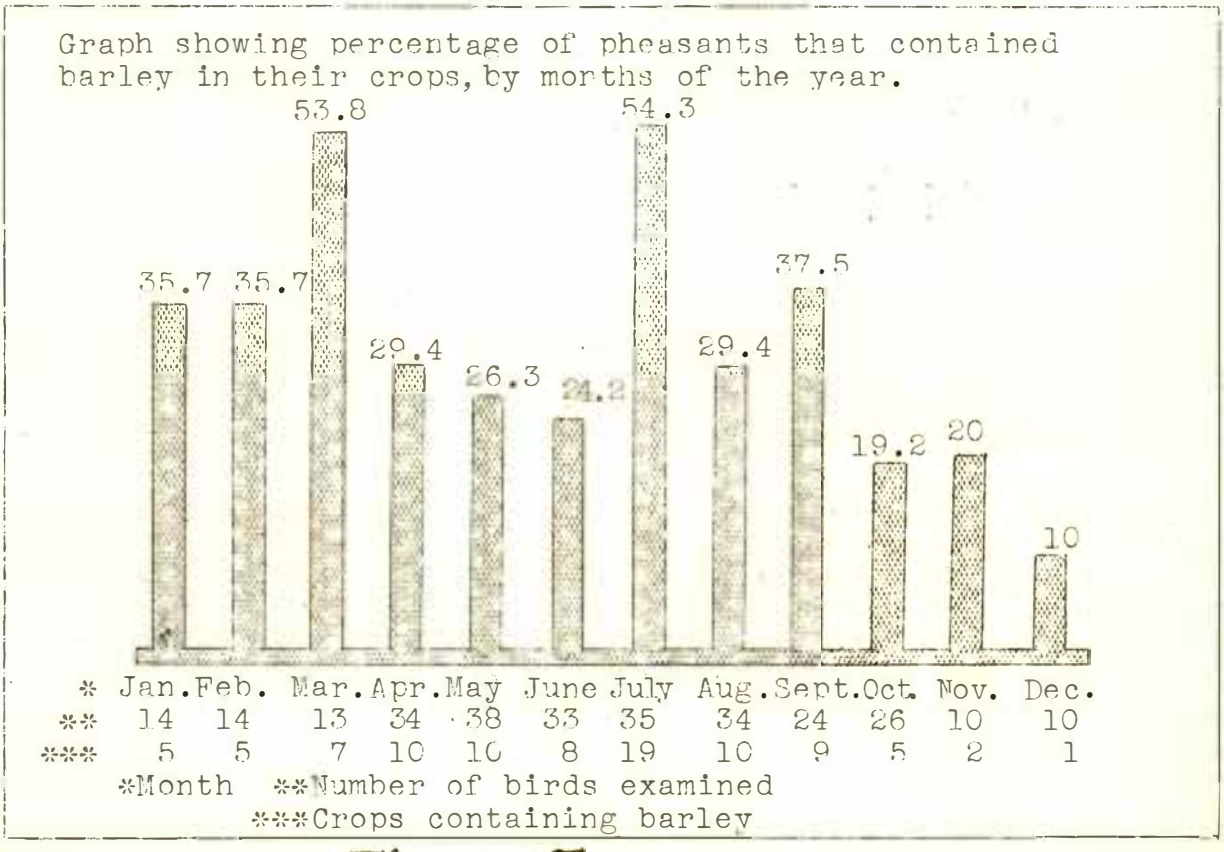


Figure 7

(P.68)

SMALL GRAINS AS FOOD OF THE PHEASANT

Of the small grains grown in South Dakota, wheat, barley, oats, rye and emmer, in the order named, are eaten most abundantly by our pheasants. The quantity of each of these grains found in the crops and gizzards of our pheasants is indicated in table 9.

TABLE 9.- Quantity of wheat, barley, oats, rye and emmer found in the crops and gizzards of the 285 pheasants used in this investigation.

Name of seed	Total number of seeds in crop	Total number of seeds in gizzard	Total number of seeds in crops and gizzards	Average number of seeds per crop for the year
Wheat	7858 in 91 crops	1909 in 76 gizzards	9767 in 106 food tubes	28.1
Barley	6036 in 91 crops	1315 in 84 gizzards	7351 in 114 food tubes	20.8
Oats	4924 in 80 crops	624 in 49 gizzards	5548 in 88 food tubes	16.3
Rye	619 in 6 crops	87 in 5 gizzards	706 in 8 food tubes	1.64
Emmer	72 in 8 crops	45 in 4 gizzards	117 in 9 food tubes	0.272

It was estimated that in 1929 (8) South Dakotans harvested the following acreage of small grains:

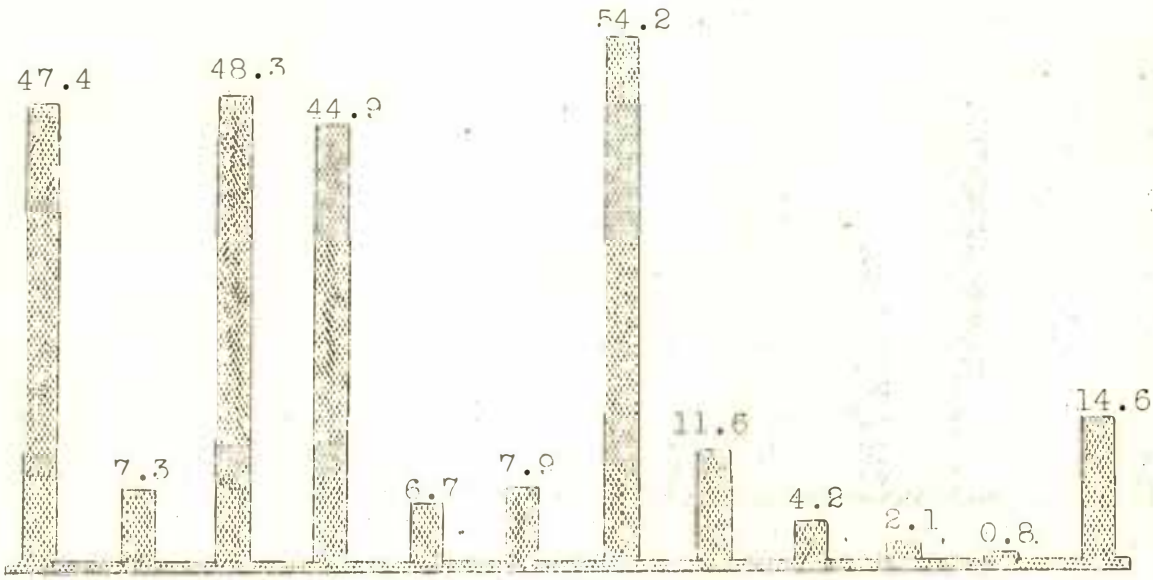
wheat . . .	3,215,899 acres	oats	2,320,152 acres
barley . .	2,032,800 "	emmer . . .	254,878 "
		rye	211,106 acres

The reader will note that except for barley and oats, and emmer and rye, which are reversed, the order of arrangement of the small grains in the above two tables are the same. From this we may conclude that the pheasant while feeding shows little if any preference for one or more of these grains over the remainder.

WHEAT: The percentage of pheasants that contained wheat in their crops for each month of the year is indicated in figure five. Figure six shows the average number of grains of wheat found during each month of the year in each of the crops of the 285 pheasants. If these averages are added and divided by 12, we find that the crop of an average pheasant on any one day during the entire year contains 28.1 grains.

Undoubtedly most of the wheat eaten by pheasants is waste grain. Just how much of the remainder is grain pecked up or grain incompletely covered, or grain pulled up, we have no way of knowing. All told, only 50 sprouted kernels of wheat were found in the crops of our pheasants, but some or even all of this might have been waste grain, in spite of the fact that it had germinated. If figure six is examined, it will be noted that an average pheasant ate a considerable quantity of wheat during each month of the year, except during January. This indicates that there must be a large amount of wheat available not only at planting time and shortly after harvest but also throughout the year.

Average number of kernels of barley found during each month of the year in each of the crops of 285 pheasants.



Number of kernels of barley in crops varied from 0 to 932

*Month **Number of birds examined

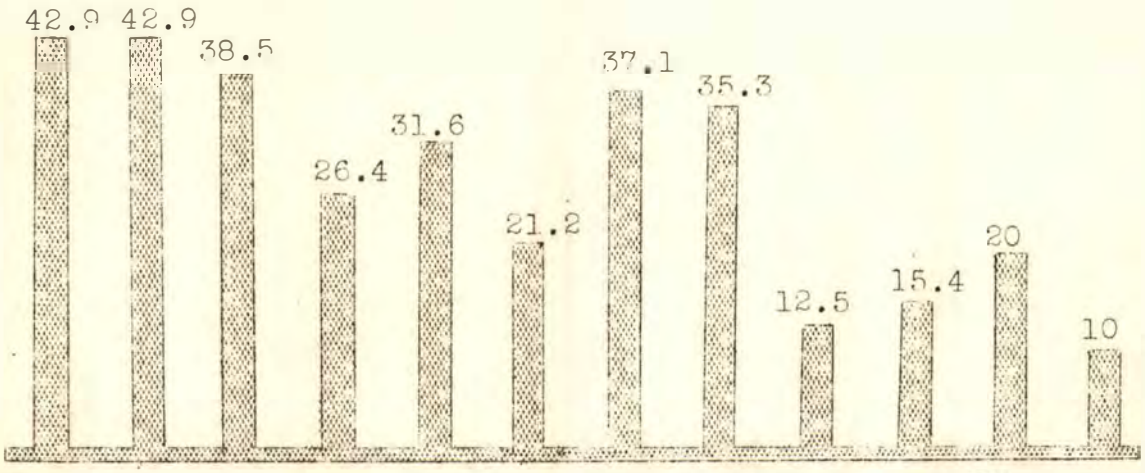
Figure 8

BARLEY: The percentage of pheasants that contained barley in their crops during each month of the year is indicated in figure seven. Figure eight shows the average number of kernels of barley found during each month of the year in each of the crops of our 285 pheasants. From figure eight it was computed that the number of kernels of barley that are to be found in the crop of an average pheasant at any one time was 20.8.

Only 4 sprouted kernels of barley were found in the crops of the pheasants used in our investigation. The values for the various months as expressed in figure 8 are, at times, unexpectedly small or large as, for instance, for the months of February and July. The reasons why such unexpected and misleading averages were obtained was undoubtedly because we did not examine a sufficient number of birds.

OATS: The percentage of pheasants that contained oats in their crops for each month of the year is indicated in figure 9. In figure 10, there is shown the average number of grains ofoats found during each month of the year in each of the crops of our pheasants. The number of grains of oats that are found in a crop of an average pheasant at any one time for the entire year is 16.3.

Percentage of pheasants that contained oats in their crops, by months of the year.



*Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
** 14	14	13	34	38	33	35	34	24	26	10	10
*** 6	6	5	9	12	7	13	12	3	4	2	1

*Month **Number of birds examined.
***Crops containing oats.

Figure 9

If figure ten is examined, it will be found that the values for January, July and April are unusually high. In January one bird had 770 grains of oats in its crop, while another had 271 grains in this compartment of its food tube. In April, one bird contained 418 kernels of oats in its crop, while two other birds contained 217 and 258 kernels of oats in their crops. In July three birds contained 714, 482 and 302 kernels of oats in their crops, respectively. It was because of the birds discussed that the values for January, April and July were abnormally high. Strange to say, not a sirgle kernel of sprouted oats was found in any of the pheasant crops which were examined.

RYE and EMMER: Rye and emmer were found in relatively small quantities in the crops and gizzards of our pheasants. A total of 619 kernels of rye and 72 kernels of emmer were found in the crops.* The number of kernels of rye and emmer found in each crop and gizzard is indicated in the following table:

*87 kernels of rye and 45 kernels of emmer were found in the gizzards.

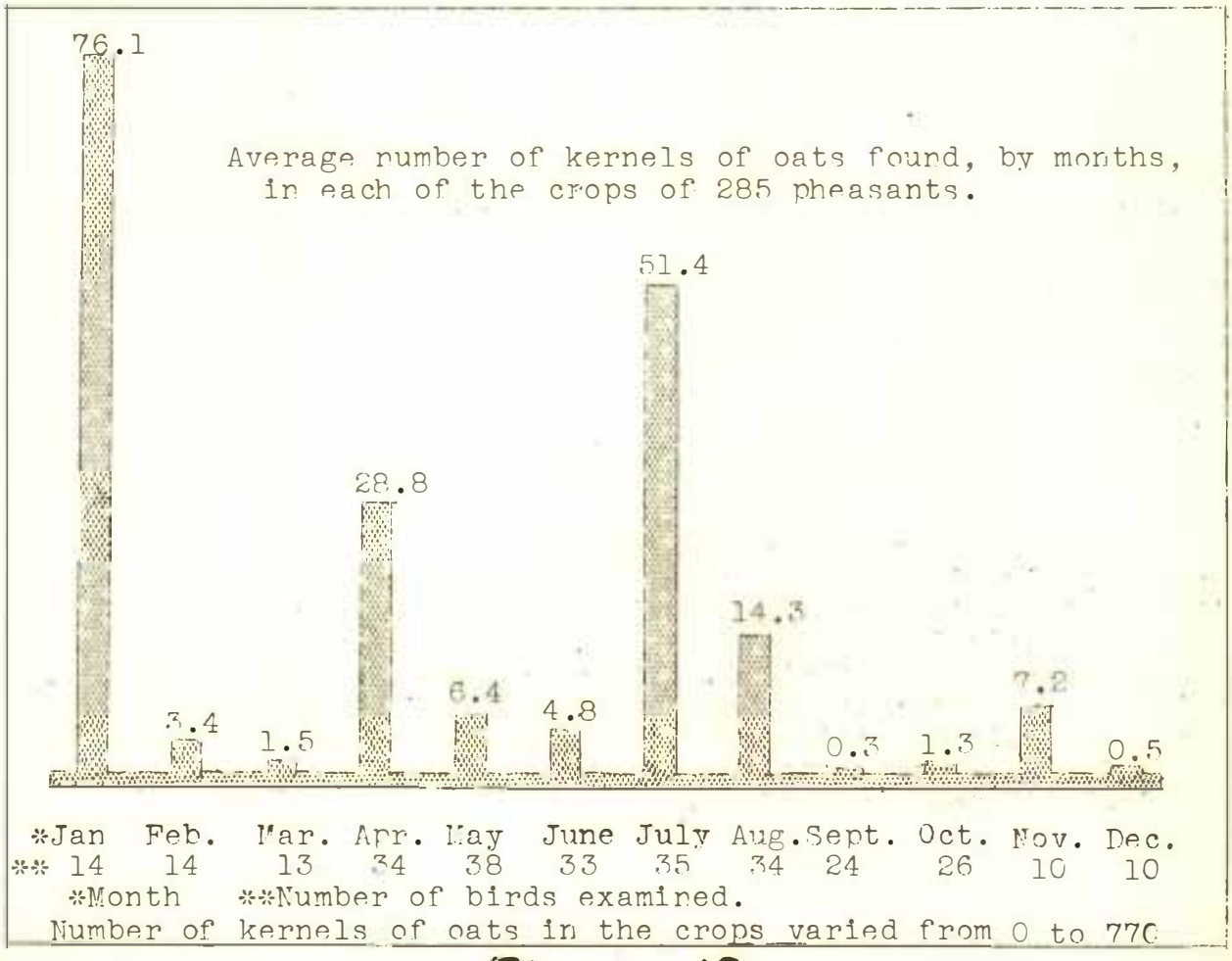
RYE

Bird number	When Shot	Kernels in crop	Kernels in gizzard
280	Feb.	50	20
153	Apr.	21	0
256	May	203	0
467	July	0	29
69	Aug.	12	0
317	Aug.	20	13
364	Aug.	313	5
323	Oct.	0	20
Total		619	87

EMMER

Bird number	When shot	Kernels in crop	Kernels in gizzard
35	Jan.	2	0
39	Mar.	8	0
27	May	5	1
62	June	0	14
368	Sept.	2	0
474	Sept.	38	19
132	Oct.	2	0
328	Oct.	14	11
34	Dec.	1	0
Total		72	45

It may be of interest to the reader to know that no sprouted rye or emmer was found in the crops or gizzards of the pheasants examined.



(P.72) Figure 10

GREEN AND YELLOW FOXTAIL, WILD BUCKWHEAT, LITTLE RAGWEED AND WILD SUNFLOWER SEEDS AS FOOD OF THE PHEASANT

Of the large number of weed seeds used as food by the pheasant in South Dakota, only those of green and yellow foxtail, wild buckwheat (black bindweed), little ragweed and wild sunflowers, will be discussed in further detail in this bulletin. These five weeds, tho harmful, are by no means the five most troublesome weeds of South Dakota. They are considered further, simply because their seeds were taken in largest quantity by the pheasants which we examined.

The seeds of these five weeds were found in the crops and gizzards of our pheasants in the abundance indicated in table 10.

TABLE 10.-Quantity of yellow and green foxtail, little ragweed, wild sunflower and wild buckwheat seed found in the crops and gizzards of the 285 pheasants used in this investigation.

Name of seeds	Total number of seeds in crops	Total number of seeds in gizzards	Total number of seeds in crops and gizzards	Average number of seeds per crop for the year
Yellow foxtail	6134 in 74 crops	9201 in 133 giz.	15,335 in 140 food tubes	19.465
Green foxtail	14,411 in 100 crops	13,390 in 124 giz.	27,801 in 140 food tubes	53.348
Little ragweed	963 in 16 crops	1,096 in 41 giz.	2,059 in 45 food tubes	4.172
Wild sunflower	1,026 in 30 crops	904 in 27 giz.	1,930 in 35 food tubes	3.536
Wild buckwheat	1,402 in 31 crops	1,570 in 107 giz.	2,972 in 112 food tubes	9.286

While all of the above-mentioned five species of weeds are generally distributed over the State, it is well to remember that wild sunflower is more abundant in the western half of South Dakota than it is in the eastern half, while the reverse is true for yellow and green foxtail, little ragweed and wild buckwheat. It is also of interest to know that, ordinarily in South Dakota, green and yellow foxtail and wild buckwheat begin to seed in mid July, wild sunflowers toward the end of July and early August, and little ragweed in October.

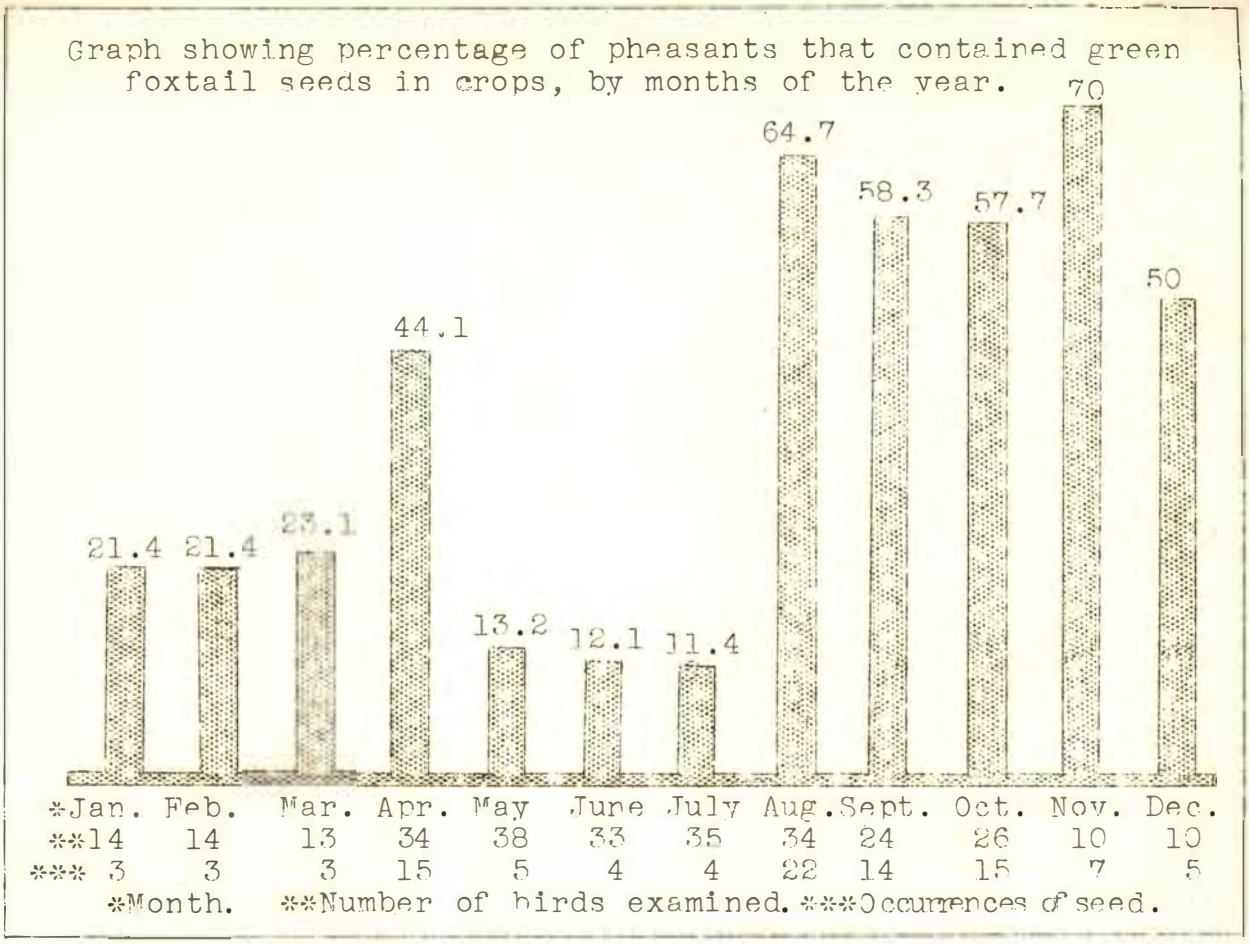


Figure 11

GREEN FOXTAIL: Figure 11 shows the percentage of pheasants that contained green foxtail seeds in their crops by months of the year, while figure 12 shows the average number of green foxtail seeds that were found in the crop of an average pheasant for the year. In figure 11 the value for April is unexpectedly high, while in figure 12 the value for March is also surprisingly high, while the values for December, January and February are low.

The number of green foxtail seeds found in the crops of our pheasants varied from 0 to 1,536. In table 11 are listed the birds whose crops contained more than 500 seeds of green foxtail.

In connection with figure 11, it may be of interest to know that in March, 3 crops of pheasants out of 13 furnished us contained seeds of green foxtail. Further, of the total of 540 seeds of green foxtail that were found in the 3 crops, 518 were in one crop.

In July only four out of the 35 pheasant crops furnished us contained seeds of green foxtail. These four crops contained a total of 722 green foxtail seeds, but one of the crops accounted for 546 of the seeds.

TABLE 11.- Pheasants whose crops contained more than 500 seeds of green foxtail.

Pheasant number	Month when shot	Number of green foxtail seeds in crop
281	March	518
467	July	546
69	August	970
367	September	594
475	September	717
321	September	764
478	October	780
324	October	781
131	October	945
323	October	934
476	October	1,536

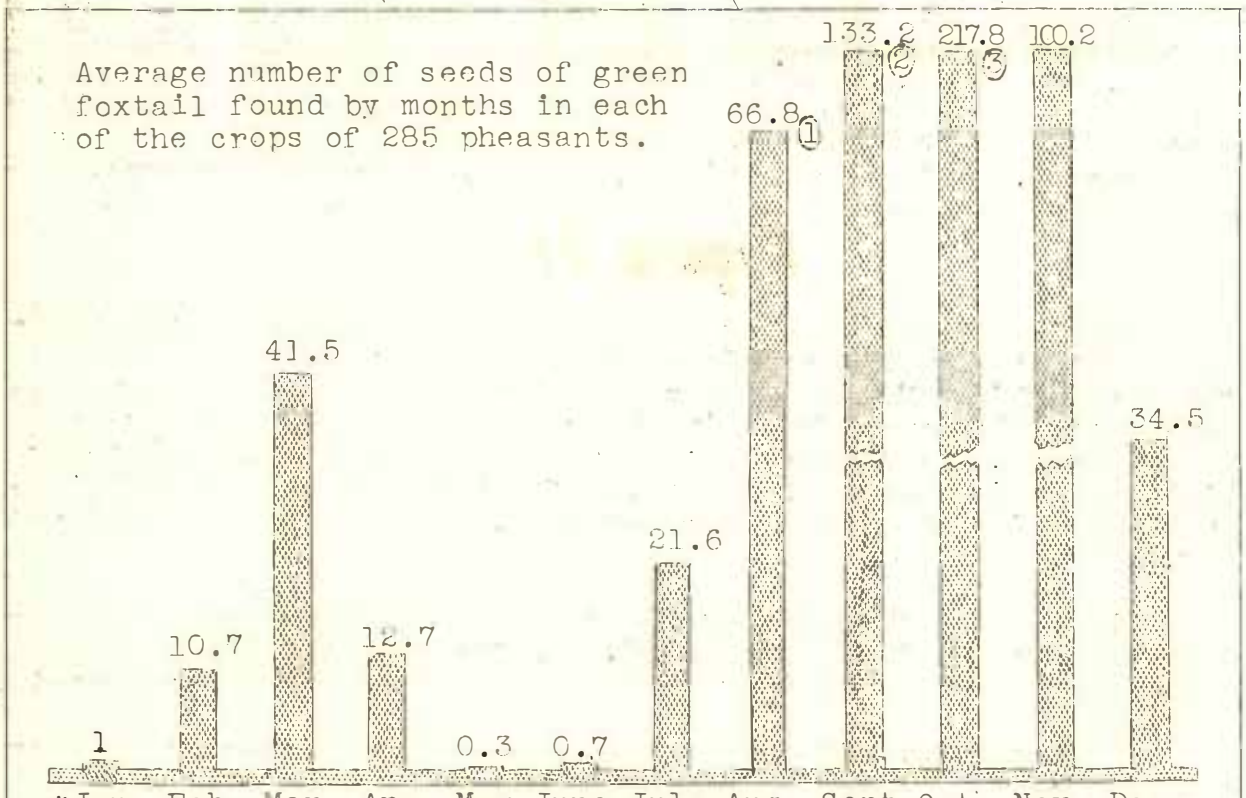


Figure 12

In August 34 pheasant crops were sent us, and 22 of these contained green foxtail seeds. A total of 2272 of such seeds were found in the 22 crops, but 970 of this total were found in one crop.

In September we received 24 pheasant crops for examination, and found that 14 of them contained seeds of green foxtail. These 14 crops contained a total of 3,198 green foxtail seeds, but three of the crops accounted for 2,075 of this total.

In October 26 pheasant crops were received, 15 of which had green foxtail seeds within them. These 15 crops contained a total of 5,664 seeds of green foxtail, but 5 of the crops were responsible for 3,976 of the seeds.

After studying figures 11 and 12 and digesting the data concerned with these graphs, one is forced to conclude that it is necessary to examine the contents of the food tubes of a much larger number of pheasants than we had access to before it is possible to state accurately the percentage of any number of pheasants that can be expected to contain seeds of green foxtail in their crops during each month of the year. It is also necessary to examine the contents of the food tubes of a much larger number of pheasants before it is possible to state accurately the average number of seeds of green foxtail that can be expected to be found by months in each crop of any group of pheasants.

YELLOW FOXTAIL: Figure 13 shows the percentage of our pheasants that contained yellow foxtail seeds in their crops by months of the year, while figure 14 shows the average number of yellow foxtail seeds per crop for the year. In both of these figures some unexpected results are shown, but undoubtedly these are to be accounted for thru the fact that an insufficient number of birds were examined.

The number of yellow foxtail seeds found in the crops of our pheasants varied from 0 to 1,532. Only three crops contained more than 500 yellow foxtail seeds each. The data concerning these three crops follows:

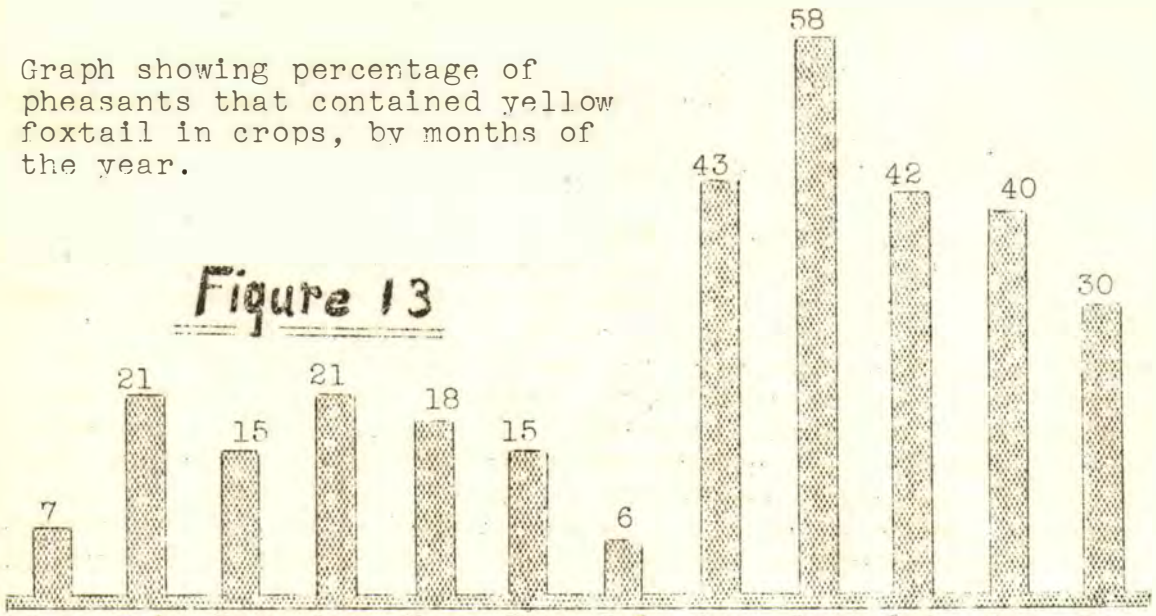
Bird number	Shot	Number of yellow foxtail seeds in crop
452	April	1,532
68	August	532
129	September	1,341

Conclusions concerning the pheasant and its feeding relation to yellow foxtail are very similar to those expressed under green foxtail and similar remarks may be made concerning figures 13 and 14 as were made for figures 11 and 12 (see green foxtail).

While figures 11 and 13 are quite similar, figures 12 and 14 are surprisingly different. One would naturally expect that figures 11 and 13, and 12 and 14 should be identical or nearly so. The fact that there are radical and unextected differences demonstrates conclusively the necessity of examining a much larger number of birds in an investigation of this sort.

Graph showing percentage of pheasants that contained yellow foxtail in crops, by months of the year.

Figure 13



	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**14	14	13	34	38	33	35	34	24	26	10	10	
***1	3	2	7	7	5	2	15	14	11	4	3	

*Month **Number of birds examined.
***Occurrences of seeds.

WILD BUCKWHEAT, LITTLE RAGWEED and WILD SUNFLOWER: Figure 15 shows the percentage of our 285 pheasants that contained the seeds of wild buckwheat in their crops by months of the year, while figure 16 shows the average number of wild buckwheat seeds per crop for the year. In figures 17 and 18 similar data are given for the seeds of little ragweed, while in figures 19 and 20 will be found similar data for the seeds of wild sunflower. In this connection it should be stated that we made no attempt to distinguish between the seeds of the different species of wild sunflower, altho it is probable that most of the wild sunflower seeds were those of our most common species of sunflower, namely Helianthus annuus L.

If figures 15,16,17,18,19 and 20 are studied, it will be noted that in each case some unexpected values are shown for a considerable number of months. These have no logical explanation except that they do not represent average conditions and the reason they do not is because the pheasant tubes which were supplied us were too few in number.

Average number of seeds of yellow foxtail found, by months, in each of the crops of 285 pheasants.

*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10

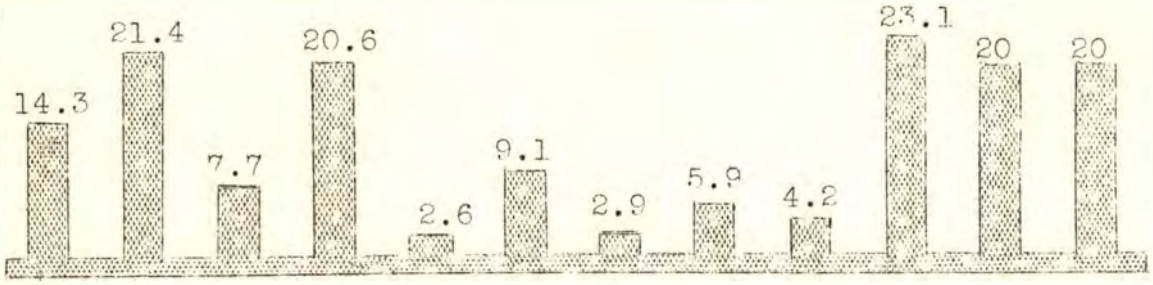
*Month **Number of birds examined.

(1) April - One bird had 1,532 seeds in its crop

(2) Sept. - One bird had 1,341 seeds in its crop
Number of seeds in crops varied from 0 to 1,532

Figure 14

Graph showing percentage of pheasants that contained seeds of wild buckwheat in crops, by months of the year.

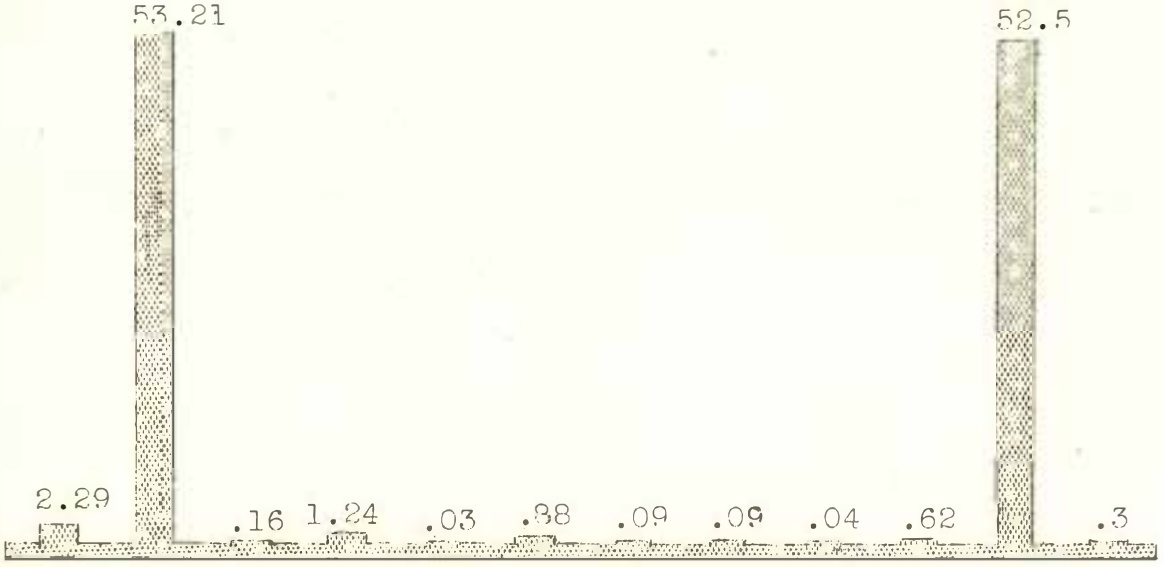


*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10
***	2	3	1	7	1	3	1	2	1	6	2	2

*Month **Number of birds examined.
***Occurrences of seeds.

Figure 15

Average number of seeds of wild buckwheat found, by months, in each of the crops of 285 pheasants.



*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10

*Month **Number of birds examined.
Number of seeds in crops varied from 0 to 717.

Figure 16

A CONSIDERATION OF THE ANIMAL FOOD EATEN BY PHEASANTS IN SOUTH DAKOTA

The animal food eaten by our pheasants consisted principally of insects, but a comparatively small number of spiders, millipedes and snails, and a small amount of broken-up pheasant egg shells were also taken. A total of 3,471 complete or nearly complete animals were found in the crops and gizzards of the pheasants which we examined, but of this number 3,375 or approximately 97 per cent were insects. The animal groups used as food by our pheasants, the number of specimens in each group, and an economic classification of each group is indicated in table 12.

TABLE 12- An economic classification of the animal food found in the crops and gizzards of our pheasants.

Animal group	Total number of specimens	Harmful specimens	Useful specimens	Neutral specimens	Doubtful Specimens
Diptera (flies and their larvae)	1,379	0	7	410	962
Orthoptera (grasshoppers, katydids, crickets)	676	528	0	148	0
Coleoptera (beetles)	541	191	11	317	22
Hymenoptera (wasps, ants, ichneumon flies, etc.)	392	379	5	0	8
Lepidoptera (moths, butterflies and their caterpillars	307	279	0	6	22
Hemiptera and Homoptera (bugs)	71	26	7	27	11
Neuroptera (lacewing flies)	9	0	9	0	0
Araneida (spiders)	68	0	68	0	0
Diplopoda (millipedes)	15	0	0	15	0
Gastropoda (snails)	13	0	0	0	13
Total	3,471	1,403	107	923	1,038

The insects found in the crops and gizzards of the pheasants were identified to species whenever it was possible to do so, but when this was not possible, then the insects were classified into their genera or families. No attempt was made to identify to the species the spiders, millipedes or snails. The identified insect material does not include the animal matter which is classed as ground up insects, ground up beetles, ground up ants, or other ground up animal materials; neither does it include the material labeled as mandibles, heads, snouts, legs, etc.

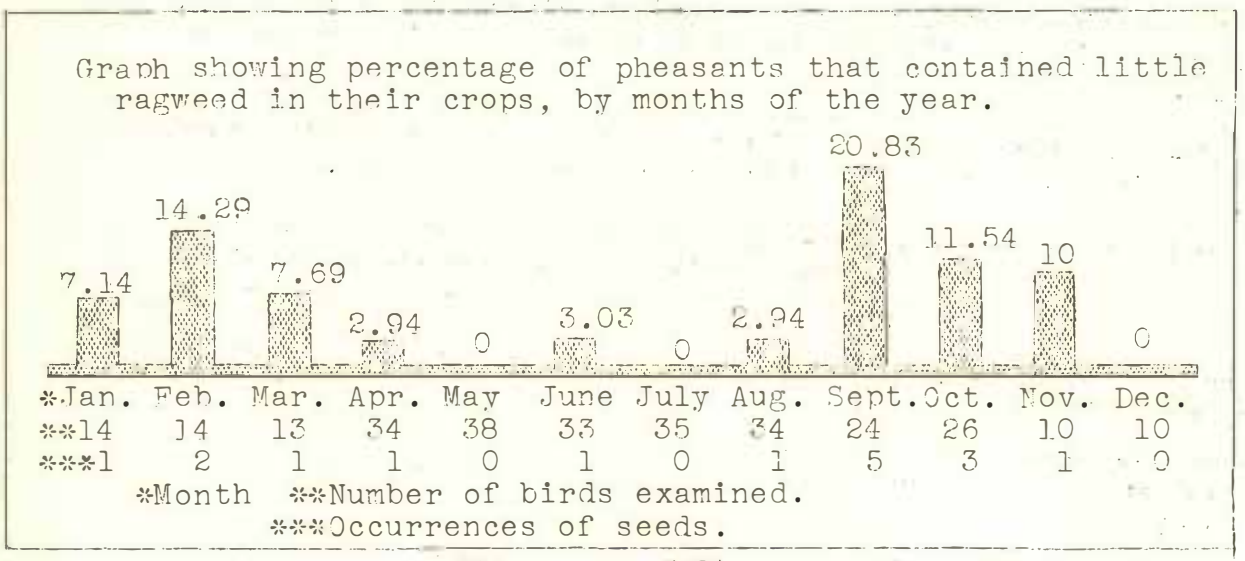
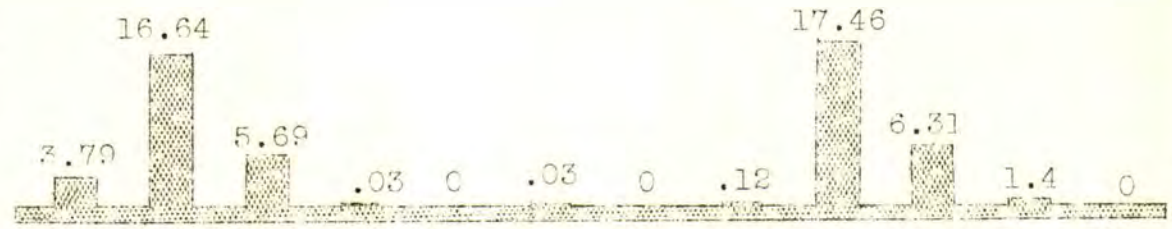


Figure 17

The classified insects numbered approximately 200 species and these represented 52 families. The Diptera contributed the largest number of specimens to the animal food of our pheasants, for approximately 40 per cent of the animals found in the crops and gizzards were flies or their larvae. The Orthoptera (grasshoppers, crickets and katydids) were next with approximately 20 per cent, and then in order followed the Coleoptera (beetles and their grubs) with 16 per cent, the Hymenoptera (wasps, ants, ichneumon flies) with 11 per cent, the Lepidoptera (moths, butterflies and caterpillars) with 9 per cent, the Hemiptera and Homoptera (bugs) with 2 per cent, the spiders with 2 per cent, the Diplopoda (millipedes) with 0.4 per cent, the snails with 0.4 per cent and the Neuroptera (lace-wing flies) with 0.3 per cent.

It will be noted from an examination of table 12 that out of a total of 3,471 animals eaten by our pheasants, 1,403 were harmful specimens (40 per cent of the total), 107 were useful to man (3 per cent of the total), 923 were neutral in character (27 per cent of the total), while 1,038 had a doubtful classification (30 per cent of the total).

Average number of seeds of little ragweed found during each month of the year in each of the crops of 285 pheasants.



*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10

*Month ** Number of birds examined.
Number of seeds in crops varied from 0 to 406.

Figure 18

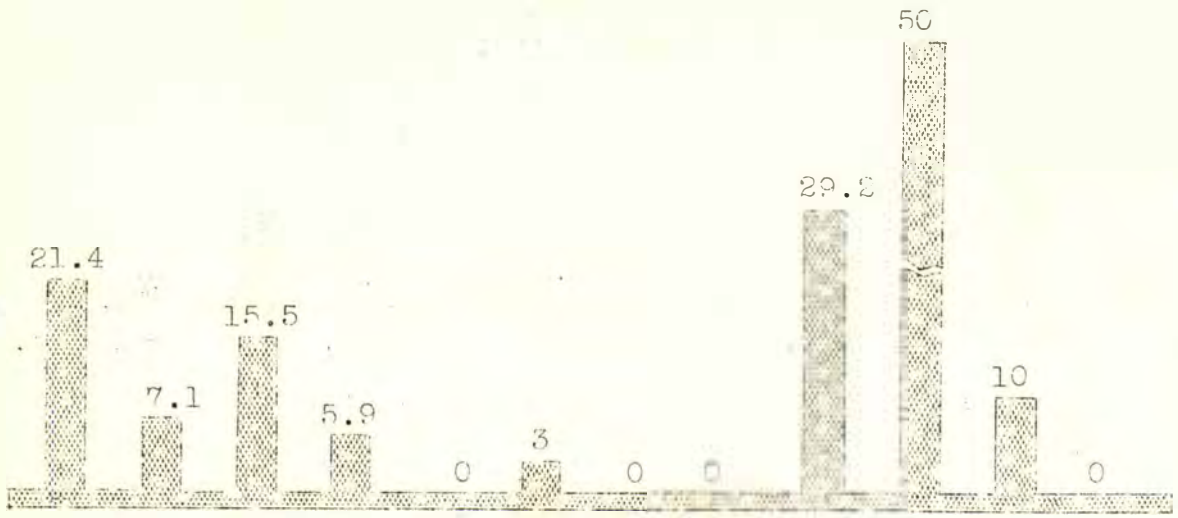
In our investigations we found no earthworms included in the food of the pheasants, but Swenk (10) claims that in central Nebraska "earthworms next to insects were the form of life most eaten, forming 2.76 per cent of the year's food and 13.57 per cent of the food eaten during May. They were sparingly eaten during April and June also, but not in any other month." Maxson (3), while investigating the food eaten by pheasants in Colorado, reports that only one pheasant out of twelve which he examined had even a portion of an earthworm in its gizzard.

Swenk (10) reports that toads were eaten by pheasants during June and July, forming 8.89 per cent of the food of the former month and 0.571 per cent of the year's food. Neither Burnett nor Maxson (2,3) found toads or any other amphibian included in the food eaten by the pheasants which they examined during their investigation carried on in Colorado. The same may also be said of Cottam (7) whose work was done in Utah.

Mice have been reported as being eaten by pheasants (6), but doubtless such food is seldom taken. In our investigations we found no remains of mammals in the food tubes of the pheasants which we studied.

The pheasant is sometimes accused of attacking and destroying the nests, eggs and young of other species of birds. An examination of the contents of the food tubes of our 285 pheasants furnished no evidence to support such a contention. However, we did find that two of our pheasants had eaten some pheasant egg shells. It is impossible to state the circumstances under which these egg shells were obtained and eaten, but it is quite probable that they were the shells of eggs from which the young had hatched. It is not unusual for pheasants in captivity, both male and female, to develop an egg-eating habit, but undoubtedly this habit is uncommon among free birds.

Graph showing percentage of pheasants that contained seeds of wild sunflower in crops, by months of the year.

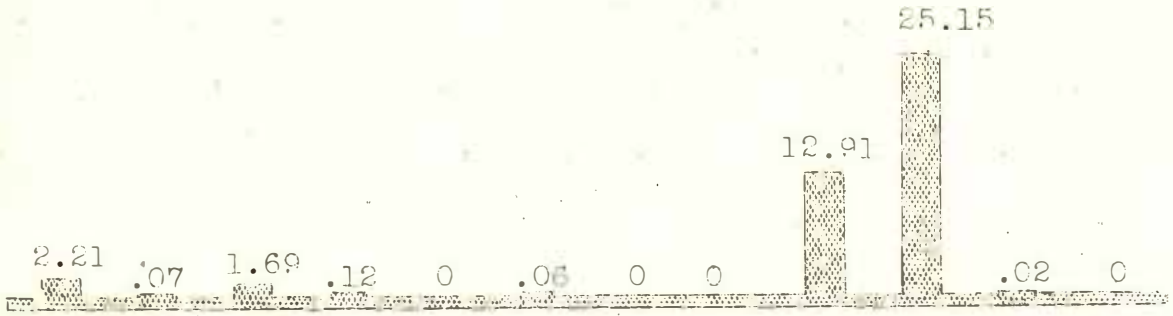


*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10
***	3	1	2	2	0	1	0	0	7	13	1	0

* Month. **Number of birds examined.
***Occurrences of seeds.

Figure 19

Average number of seeds of wild sunflower found, by months, in each of the crops of 285 pheasants.



*	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10

*Month **Number of birds examined.
Number of seeds in crops varied from 0 to 322.

Figure 20

COLEOPTERA (BEETLES) AS FOOD OF THE PHEASANT

A total of 541 entire or nearly entire specimens of beetles were found in the crops and gizzards of our 285 pheasants, or approximately 2 beetles, on an average, per bird. All but seven of these beetles were well enough preserved so that they could be classified into their families, while most of them could be identified to the species. In addition, occasionally the crops but much more frequently the gizzards of our pheasants contained a considerable amount of broken up material representing the bodies of beetles. This material was identified whenever possible and all of it was listed in the analysis of the crop and gizzard contents of each pheasant, but it was not considered in the data presented in table 13.

The entire lot of whole or nearly whole beetles, except the seven which could not be identified, represented 13 different families. In table 13 these 13 families are listed. In addition the number of these beetles used as food in each family are indicated, and finally an economic summary of the beetles is given.

It may be observed from table 13 that out of a total of 541 whole or nearly whole beetles found in the food tubes of our pheasants, 11 specimens were classed as useful to mankind, 191 were harmful, 317 neutral and 22 were assigned a doubtful status. In other words, 317 beetles or approximately 59 per cent of the entire number consumed were of no economic importance to man. The beetles which are classed as actually harmful to man formed approximately 35 per cent of the entire lot, while the numbers which are regarded as beneficial to man constituted about two per cent.

The Carabidae or ground beetles were taken in largest numbers by our pheasants. Following these came the Chrysomelidae or leaf beetles, then the Curculionidae or snout beetles, the Scarabaeidae or lamellicorn beetles, the Elateridae or click beetles and the parents of the wireworms, the Tenebrionidae or darkling beetles and the parents of the plains false wireworms, the Anthicidae or ant-like flower beetles, the Staphylinidae or rove beetles, and the Coccinelidae or lady-bugs. The remainder of the families were each represented by less than three specimens in the food contents of our pheasants and are not listed here.

Strange to say, not a single specimen of the Colorado potato beetle was included in the food contents of our pheasants. However, pheasants have been known to feed upon the Colorado potato beetles, for both Burnett (2) and Maxson (3) report finding such beetles in both the crop and gizzard contents of the birds that they examined in Colorado. It is only fair to state, however, that the Colorado potato beetles were unusually scarce in South Dakota during the year of this investigation.

TABLE 13 - Families of Coleoptera represented in the food or our 285 pheasants, the total number of beetles used as food belonging to each family and an economic summary of the beetles.

	Total number of specimens	Number of harmful specimens	Number of useful specimens	Number of neutral specimens	Number of specimens of doubtful status
Anthicidae (ant-like flower beetles)	8	0	0	8	0
Byrrhidae (Pill beetles)	2	0	0	2	0
Carabidae (ground beetles)	181	4	6	162	9
Chrysomelidae (leaf beetles)	153	68	0	85	0
Cicindelidae (tiger beetles)	1	0	1	0	0
Cleridae (checkered beetles)	1	0	1	0	0
Coccinelidae (lady-bugs)	3	0	3	0	0
Elateridae (click beetles)	25	24	0	0	1
Hydrophilidae (water scavenger beetles)	1	0	0	1	0
Scarabaeidae (lamellicorn beetles)	69	10	0	58	1
Staphylinidae (rove beetles)	4	0	0	1	3
Tenebrionidae (darkling beetles)	13	12	0	0	1
Curculionidae (snout-beetles)	73	73	0	0	0
Unidentifiable beetles	7	0	0	0	7
Totals	541	191	11	317	22

In conclusion it may be noted from table 3 that pheasants eat a surprisingly large number of species of beetles. The birds apparently do not show any preference for any particular species or group of species of beetles, but since they are principally ground-feeding or pecking [illegible] birds, naturally the beetles consumed are chiefly soil inhabiting or the beetles feed upon low growing plants.

LEPIDOPTERA (MOTHS, BUTTERFLIES and CATERPILLARS) AS FOOD OF THE PHEASANT

Seven moths, two butterflies, two pupae and 296 caterpillars were included in the food found in the crops and gizzards of the pheasants examined in this investigation. Six of the seven moths could not be identified, even to the family, while the two butterflies were adults of the imported cabbage worm. Of the caterpillars, 294 were identified at least to the families, while the remaining two could not be classified.

All told, at least six families of Lepidoptera were represented by the caterpillars. These families are listed in table 14. In addition, the total number of caterpillars of each family eaten by our pheasants are indicated in this table and an economic summary is given of the caterpillars.

From table 14, it is to be noted that 279 specimens of Lepidoptera devoured by our pheasants were classed as harmful to man, six were regarded as neutral and 22 were assigned a doubtful economic classification.

The striking and important point in connection with table 14 is the fact that 240 cutworms were eaten by our pheasants. The importance of this is discussed in this publication under the caption "Cutworms and Pheasants". It is of interest to note that while many different caterpillars may be eaten by pheasants, the ground inhabiting species are used more often as food.

TABLE 14 - Families of Lepidoptera represented in the food of our 285 pheasants, the total number of specimens used as food and belonging to each family, and an economic summary of the caterpillars.

Family	Total number of specimens	Number of harmful specimens	Number of useful specimens	Number of neutral specimens	Number of specimens with questionable economic classification
Arctiidae (tiger-moths	3 caterpillars	3 caterpillars			
Geometridae (geometrids)	1 moth 1 caterpillar	1 moth 1 caterpillar			
Noctuidae (owlet moths)					
Caenurgia sp?	5 caterpillars	5 caterpillars			
Cirphis unipuncta	1 army worm	1 army worm			
Cirphis sp?	4 caterpillars	4 caterpillars			
Cutworms sp?	240 cutworms	240 cutworms			
Mamestra picta	1 caterpillar	1 caterpillar			
Neleucania sp?	4 caterpillars	4 caterpillars			
Noctuidae sp?	17 caterpillars	17 caterpillars			
Nymphalidae					
Nymphalidae sp?	1 pupa 4 caterpillars			1 pupa 4 caterpillars	
Anosia plexipus (milkweed caterpillar)	1 caterpillar			1 caterpillar	
Pieridae					
Pieridae sp?	6 caterpillars				6 caterpillars
Pieris rapae (imported cabbage worm)	2 butterflies	2 butterflies			
Pyralidae					
Pyralidae sp?	5 caterpillars				5 caterpillars
Pyrausta sp?	2 caterpillars				2 caterpillars
Moths sp?	6 moths, 1 pupa				7
Caterpillars sp?	2				2
Totals	307	279	0	6	22

It is surprising to find that cutworms constituted even a minor food item in the feeding activities of the pheasant. Ordinarily, surface feeding cutworms feed chiefly at night, but they may become active towards evening or even during the daytime, provided it is cloudy and warm. In the crops of our pheasants we found 131 cutworms, while 109 cutworms were found in the gizzards (Table 3) or a total of 240 cutworms in both crops and gizzards. We are unable to state whether our pheasants found these cutworms while the cutworms were feeding on the surface of the ground or whether the pheasants found them by "pecking" in the soil, thus uncovering them.

Graph showing percentage of pheasants that contained cutworms in crops, by months of the year.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	0	.07	0	.09	.24	.21	0	0	0	0	.10	0
*Month												
**Number of birds examined.	14	14	13	34	38	33	35	34	24	26	10	10
***Occurrences of cutworms.	0	1	0	3	9	7	0	0	0	0	1	0

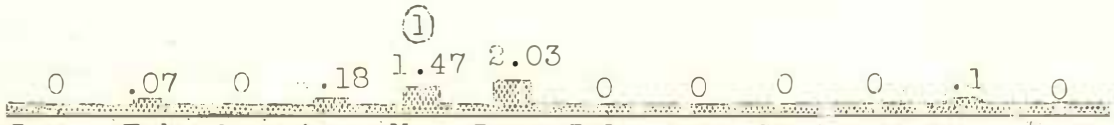
Figure 21

In figure 21 we have indicated in graph form the percentage of pheasants that contained cutworms in their crops, by months of the year, while in figure 22 we depicted in graph form the average number of cutworms found, by months, in each of the crops of our 285 pheasants. It is rather surprising to find that each pheasant consumed 0.311 cutworms in an average meal for the year. If we assume that a pheasant eats two such meals per day and every day during the year, then each pheasant will devour approximately 227 cutworms.

It does not necessarily follow that a pheasant is doing a service to man every time it devours a cutworm. Whether or not the act is beneficial will depend upon many circumstances. The cutworm may have been feeding upon useful plants, it may have been feeding upon injurious plants, or it may have been feeding upon plants that have a neutral classification. It is also possible that the cutworm may have been feeding upon a combination of plants of any two or even

all three of the categories mentioned. If the pheasant obtained the cutworm in a cornfield and if the cutworm actually was cutting off the corn, then the following questions arise. Under what conditions did the pheasant obtain the cutworm? Did the pheasant find the cutworm on the surface of the ground or did it peck about and thus locate it? If it did peck about, did it injure or destroy any corn while doing so? Did it expose the roots of the corn plant, thus making it probable that the plant will dry up? The opinion has been expressed to me by a prominent farmer that he preferred to take a chance with cutworms in a field of corn rather than with a number of pheasants, even tho the pheasants were seeking and devouring the cutworms. It is highly desirable that field observations be made along lines discussed, and until such observations are made, the question of how much good the pheasants are doing in a cornfield when they devour cutworms will always remain debatable.

Average number of cutworms found, by months, in each of the crops of 285 pheasants.



*Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**Number of birds examined	14	14	13	34	38	33	35	34	24	26	10	10

Number of cutworms in crops varied from 0 to 38

(1) One bird had 38 cutworms in its crop.

Figure 22

Pheasant number 60 is interesting because it was shot in a cornfield owned by a farmer who complained to Harry Cotman, a deputy game warden, that pheasants were destroying his corn. This bird was shot in Beadle County at 8 P.M., May 31, 1929. The surrounding fields were in small grain, alfalfa and corn.

Quite a variety of food was found in the crop and gizzard of bird number 60, but it was interesting to learn that this bird had 38 cutworms and 61 kernels of unsprouted corn in its crop. In the gizzard, we found 25 cutworms with an additional 5 heads and 16 mandibles of cutworms, and 4 kernels of unsprouted corn and 14 fragments of corn kernels. It should be remembered in connection with this bird, that all the corn was up in the field which the pheasant was supposed to be damaging, also that we found no sprouted corn in either the crop or gizzard of the pheasant examined. Mr. Cotman reported that he found many worms which he believed to be cutworms in this field. We have no proof

that Pheasant number 60 found all or any of the cutworms in the cornfield discussed. If it be assumed that some or all of the cutworms were taken by the bird from this cornfield, then we must acknowledge that we have no information concerning the amount of damage, if any, the pheasant did to the corn while it was gathering up the 63 cutworms which were found in its crop and gizzard.

It is the opinion of the writer, however, that this bird was highly beneficial when it destroyed the cutworms which were found in its food tube. Undoubtedly, the service it thus rendered far outweighed any damage that it might have done to the corn or other crops while in the process of locating the cutworms.

M. B. Swenk (10) after investigating the food habits of the ring-necked pheasant in central Nebraska, writes as follows regarding the use of cutworms as food by pheasants: "Cutworms of several species were eaten freely in May and June (maximum), and to a less extent in July, this item constituting 1.41, 7.61 and 0.987 per cent respectively of the food of these months. These cutworms included many of the most destructive cornfield cutworms in Nebraska, such as the dark-sided cutworm (Euxoa messoria), dingy cutworm (Feltia ducens), bronzed cutworm (Nephelodes emmedonia), greasy cutworm (Agriotis ypsilon), and granulated cutworm (Feltia annexa), the order given indicating the relative amount of each species consumed by the pheasant."

W. I. Burnett (2) and Asa C. Maxson (3) made a study of the food of 60 ring-necked pheasants in Colorado, but found that the food which had been taken by these pheasants included only three cutworms.

Leffingwell (6) reports that a pheasant killed and examined by W. L. Finley in Oregon on November 1 contained 303 cutworms and 60 blue bottle fly maggots.

ORTHOPTERA USED AS FOOD BY PHEASANTS

Three families of Orthoptera were represented in the food eaten by our pheasants, namely the family Acrididae (locusts or short horned grasshoppers), the family Gryllidae (field and tree crickets) and the family Tettigoniidae (katydids and meadow grasshoppers). Since the Tettigoniidae are a relatively unimportant group economically considered and since a total of only 15 specimens were eaten by our pheasants, this family will not be considered further. On the other hand, the Acrididae and the Gryllidae include many important economic species and since our pheasants ate a considerable number of grasshoppers and crickets, a thoro discussion of the relationship of pheasants to grasshoppers and crickets will follow.

GRASSHOPPERS AS FOOD OF THE PHEASANT

The investigation covered by this report extended over a year when grasshoppers were more abundant than usual, but in no section of the state were they sufficiently abundant to cause any extensive damage to farm or garden crops.

Our data indicates that the pheasant is not a heavy consumer of grasshoppers during years when these insects are normal or slightly above normal in numbers, for a total of only 431 grasshoppers were found in the crops and gizzards of the 285 pheasants which we examined. In the crops of our pheasants we found 398 grasshoppers, while the gizzards contained only 33 specimens. In addition, the gizzards contained a considerable amount of material representing broken up grasshopper bodies, such as heads or portions of heads, mandibles, legs, wings, thoraces and abdomens. The crops likewise contained some of this type of food, but it was comparatively scarce.

All but 66 of the grasshoppers found in the food tubes of our pheasants were identified to the species, and the identified specimens represented 17 different species (Table 3). The 66 specimens which were not identified to the species contained one specimen of the genus Encoptolophus, and 51 specimens of Melanoplus. The 66 unidentified grasshoppers were badly distorted and sometimes broken, so that identification of them was impossible.

Most of the grasshoppers found in South Dakota may be classed as injurious species under ordinary circumstances. The four species which are outstanding because of the immense amount of damage which they frequently cause are the two-striped locust (98), the differential grasshopper (102), the red-legged grasshopper (103), and the lesser migratory locust (106).

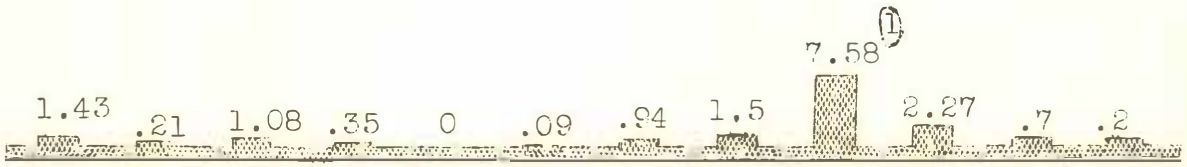
Graph showing percentage of pheasants that contained grasshoppers in crops, by months of the year.

*	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**	14	14	13	34	38	33	35	34	24	26	10	10
***	2	1	4	6	0	2	8	13	12	11	3	1

*Month. **Number of birds examined.
***Occurrences of grasshoppers.

Figure 23

Average number of grasshoppers found, by months, in each of the crops of 285 pheasants.



*Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
**14	14	13	34	38	33	35	34	24	26	10	10

*Month. **Number of birds examined.

Number of grasshoppers in crops varied from 0 to 92.

(1) One bird had 92 grasshoppers in its crop.

Figure 24

These four species of grasshoppers were fairly abundant during the course of this investigation, but as indicated below, they were found in unexpectedly small numbers in the crops and gizzards of our pheasants:

two-striped grasshopper	- 18	specimens	in	crops	and	gizzards
differential "	- 19	"	"	"	"	"
red-legged "	-232	"	"	"	"	"
lesser migratory"	- 15	"	"	"	"	"

It will be noted from a study of table 3 that no species of grasshopper was eaten in large numbers by our pheasants. Not a single species of grasshopper was taken at the rate of one specimen or more per meal. The red-legged locust was taken in greatest abundance by our pheasants and averaged 0.79 locust per meal. If all the species of grasshoppers eaten by our pheasants are considered a group of grasshoppers, and no distinction is made as to species, then we find that our pheasants averaged 1.36 locusts per meal. In figure 23 we have indicated in graph form the percentage of pheasants which contained grasshoppers in their crops by months of the year, while in figure 24 there is depicted in graph form the average number of grasshoppers found by months in each of the crops of our 285 pheasants.

If we assume that all of the pheasants that we examined had lived thruout the year, and if these pheasants had eaten two meals per day and if the numbers of grasshoppers eaten by each pheasant during the 12 months of the year were identical with the averages given in figure 24, then each pheasant would have eaten the following numbers of grasshoppers during the year:

In January	88.7 grasshoppers	In July	58 grasshoppers
In February	11.8 "	In August	93 "
In March	67 "	In September,	454.8 "
In April	21 "	In October,	140.7 "
In May	0 "	In November,	42 "
In June	5.4 "	In December,	12.4 "
		Total for the year	994.8 "

From a study of figure 24 it may be seen that September is the banner month for grasshopper consumption, with an average of 7.58 grasshoppers per pheasant per meal. Next in rank comes October with 2.27 grasshoppers per crop and then follow August, January, March, July, November, April, February, December and June. May is conspicuous because none of the pheasants examined during this month contained grasshoppers in their crops.

Practically all of the grasshoppers found in the crops of our pheasants during November, December, January, February, March, and April were specimens that were dead when eaten by the birds.

These grasshoppers totaled 58 specimens or approximately 15 per cent of the entire lot found in the crops of all of our pheasants. From an economic standpoint, it did not reduce the grasshopper population to have our pheasants pick up and devour these dead grasshoppers and further, it did not reduce the number of grasshopper eggs in the soil at the end of the year.

The largest number of grasshoppers were eaten by our pheasants in September and October. The reasons why this probably occurred were the following: 1st, because in September and October the weather is getting considerably cooler and this slows up the grasshoppers considerably: and second, because most of our grasshoppers have reached or are nearing the end of their natural life at this time of year. Since, therefore, most of our grasshoppers have done the greatest amount of damage of which they are capable by September 15 and since they have laid most of their eggs by this time, the grasshoppers that are eaten after September 15 are ordinarily of little economic importance so far as the grower of crops is concerned.

If the pheasants are to act as an important check upon grasshopper abundance and injury, it is imperative that they eat ar abundance of grasshoppers during the months of May, June, July and August. Since such is not the case, we are forced to conclude that the pheasant reduces the grasshopper population of the state but little. This is borne out by the fact that outbreaks of grasshoppers occurred in 1931, 1932 and 1933 in areas where the pheasants were abundant. It is undoubtedly true that pheasants do increase their grasshopper consumption during a year when these insects are more abundant than usual, but this increase is not sufficiently large nor are the numbers of pheasants per acre great enough to make any practical difference in the total number of surviving grasshoppers. As a matter of fact, it is the writer's opinion that the pheasant does more practical good in reducing the numbers of grasshoppers during a year when these insects are not abundant than when they occur in outbreak numbers. It should be remembered in this connection that each acre contains 43,560 square feet, and that it is not unusual in a grasshopper year to average from one to ten or even more grasshoppers per square foot in many fields.

Only one pheasant, bird number 39, had fed upon grasshopper eggs. This bird was shot April 10, 1930, in a field of wild hay containing many weed patches. The crop of this bird contained 36 grasshopper eggs, but where these were obtained and under what circumstances, we are unable to state. Under the conditions that existed when this investigation was in progress, it seems that pheasants exercise little control over grasshoppers by feeding on their eggs.

However, in the fall of 1933, Louis I. Thompson, County Agent of Potter County, South Dakota reported to the writer that it was not uncommon for pheasants shot during the hunting

season in Potter County to have grasshopper eggs in their crops. Some of the grasshopper eggs and egg pods found in the crop of one pheasant were sent to the writer by Mr. Thomoson with the remark that these constituted only about one-half of the total. None of the egg pods sent us were entire, but all were broken across at different levels. By actual count, the number of free eggs and those included in the pods totaled 2,048. In explanation it should be stated that grasshoppers had been abundant in Potter County during the year 1933 and that probably less than one inch of rain had fallen in this county during the interval June 1, 1933 to October 30, 1933.

CRICKETS AS FOOD OF THE PHEASANT

Three species of crickets were eaten by the pheasants which we examined, namely specimens of the common black field cricket (110), specimens of the striped ground or Nemobius cricket (111) and specimens of the black-horned tree cricket (112). The number of each of these crickets that were found in the food tubes of our pheasants is indicated herewith:

common black field cricket . . .	97 specimens	in 26	birds
striped ground cricket	122 "	" 3	"
black horned tree cricket . . .	11 "	" 8	"

The three species of crickets eaten by our pheasants are potentially injurious in South Dakota, but only the first named is so classified by McAtee in table 3 of this bulletin.

It is surprising that not more of the black field crickets and striped ground crickets were taken by our pheasants, for they are abundant and easily caught. These two species of crickets may usually be found in fairly large numbers roaming over the ground at times of the day when the pheasants are feeding. Pheasant number 327 is outstanding for the large number of crickets that it contained in its crop and gizzard.This bird was shot October 22, 1929 at 5:30 P.M. in a sweet clover field in Hamlin County, and contained 3 black field crickets and 112 striped ground crickets in its crop and 8 striped ground crickets in its gizzard. In addition, it contained a considerable amount of broken up or ground up body parts of crickets.

It is evident from our investigation that while an occasional pheasant may eat quite a large number of crickets at a meal, these insects do not form a large item in the food of the average pheasant.

DIPTERA (FLIES AND THEIR LARVAE) AS FOOD OF THE PHEASANT

A total of 1,379 flies or their larvae were found in the food tubes of the pheasants that were used in this investigation, or not quite five specimens per bird on an average. All but 15 of these specimens were identified to their family name. Most of those that were identified to the family were further classified to their specific name.

Ten families were represented by the identified flies or larvae and these are listed in table 15. In addition, the total number of flies or larvae of each family are indicated in this table and an economic summary is given of the insects.

TABLE 15 - Families of Diptera represented in the food of our 285 pheasants, the total number of flies or their larvae belonging to each family and an economic summary of the members of each family.

Family	Total number of specimens	Number of harmful specimens	Number of useful specimens	Number of neutral specimens	Number of questionable specimens
Asilidae (robber flies)	3	0	3	0	0
Bibionidae (march-flies, adults)	62	0	0	0	62
(" " , larvae)	885	0	0	0	885
Borboridae (borborid flies)	394	0	0	394	0
Chironomidae (midges)	1	0	0	1	0
Dolichopodidae (long-legged flies)	1	0	0	1	0
Empididae (dance-flies)	4	0	0	4	0
Leptidae (snipe-flies)	3	0	3	0	0
Muscidae (muscid-flies)	9	0	0	9	0
Tachinidae (tachina-flies)	1	0	1	0	0
Tipulidae (crane-flies)	1	0	0	1	0
Diptera unclassified	15	0	0	0	15
Totals	1,379	0	7	410	962

Of the total of 1,379 flies or larvae devoured by our pheasants, seven are classed as useful, 410 as neutral and 962 are listed as having a questionable economic status. March-flies and their larvae were taken in largest numbers, for 885 larvae and 62 adults of Bibio albipennis were eaten by 61 of our pheasants. These larvae occur in enormous numbers on some of our South Dakota farms in late fall and early spring and, at times, have been reported as being injurious to crops.

Swenk (10), after examining the food habits of the ring-necked pheasant in central Nebraska reports that march-fly larvae were taken in considerable numbers by pheasants. The larvae were eaten by the pheasants in March, April and November and constituted 4.62 per cent of the total April food. McAtee and Beal of the U. S. Biological Survey (4) state that they found 360 and 432 larvae of march-flies in the stomachs of two pheasants (ring-necked or English?) shot in Oregon, Washington or British Columbia.

Next to march-flies and their larvae, borborid flies were taken in largest quantities by our South Dakota pheasants. However, only one pheasant fed upon borborid flies, but this bird took 394 specimens. The remainder of the flies, as may be noted from table 15, were taken in negligible numbers by our pheasants.

We must conclude from our data that pheasants do not use flies as food in any large quantity. Only an exceptional species may be taken in considerable numbers in the adult or fly stage, and the same is true of the maggot or larval stage of flies. If march flies and their larvae are not classed as harmful, then not a single fly or maggot harmful to man was found in the food tubes of our pheasants.

HEMIPTERA AND HOMOPTERA (BUGS) AS FOOD OF THE PHEASANT

Only 71 whole or nearly whole bugs were found in the food tubes of the 285 pheasants which were used in this investigation. All but six of these 71 bugs were identified to their family name, and most of them to the specific name.

Ten families were represented by the identified bugs. In table 16 the family names are listed. In addition, the total number of bugs of each family used as food are indicated and an economic summary is given of the bugs of each family.

TABLE 16 - Families of Hemiptera and Homoptera (bugs) represented in the food of our 285 pheasants, the total number of bugs used as food and belonging to each family and an economic summary of the bugs of each family.

Family	Total number of specimens	Number of harmful specimens	Number of useful specimens	Number of neutral specimens	Number of questionable specimens
Aphididae (plant-lice)	3	3	0	0	0
Cicadellidae (leaf-hoppers)	2	1	0	1	0
Fulgoridae (lantern-fly insects)	3	0	0	3	0
Lygaeidae (chinch-bug family)	4	2	0	2	0
Membracidae (tree-hoppers)	5	1	0	4	0
Miridae (leaf-bugs)	19	19	0	0	0
Nabidae (damsel-bugs)	4	0	4	0	0
Pentatomidae (stink-bugs)	15	0	0	10	5
Phymatidae (ambush-bugs)	3	0	3	0	0
Scutelleridae (shield-backed bugs)	7	0	0	7	0
Hemiptera unclassified	6	0	0	0	6
Totals	71	26	7	27	11

From table 16 it is to be noted that out of a total of 71 bugs, 26 were classed as injurious to man, 7 as useful, 27 as neutral and 11 were given a questionable classification. The most important harmful bugs listed in the food of our pheasants

are the false chinch bug, the buffalo tree-hopper, aphids and the leaf-bugs of the genus Lygus. Since only 10 specimens of these injurious insects were found in the crops and gizzards of our 285 pheasants, it must be concluded that the pheasants are a negligible factor in keeping in check our harmful Hemiptera and Homoptera.

HYMENOPTERA (ANTS, ICHNEUMON FLIES, CHALCID FLIES, SAWFLIES AND WASPS) AS FOOD OF THE PHEASANT

Hymenoptera were represented in the food of our 285 pheasants by 392 specimens or by approximately 1.4 of these insects per bird. All but three of the Hymenoptera eaten were identified as far as the family and most of them were classified to their specific name.

The Hymenoptera which were well enough preserved so that they could be classified into their families, were found to represent eight families. These families are listed in table 17, and in this same table there is indicated the number of specimens of each family used as food by the pheasants and found in the food tubes of the birds. In addition, an economic summary of the insects is given by families.

From table 17 it may be seen that out of a total of 392 Hymenoptera that were eaten by our pheasants, 379 were classed as injurious, five were beneficial, while eight were given a questionable economic classification. It must be concluded, therefore, that the pheasants, when feeding upon Hymenoptera, do more good than harm so far as the interests of man are concerned. It is surprising to learn that out of a total of 392 Hymenoptera that were devoured by our pheasants, 367 specimens were ants. Only a single bee was found in the food tubes of the pheasants which we examined, and only three wasps were eaten. Braconids, chalcids and ichneumon flies, which are all parasitic, were represented by a total of only seven specimens, while the sawflies were represented by twelve. When one remembers that the ring-necked pheasant picks up most of its food from the surface of the ground, it is not surprising to find that the ants far outnumber all other Hymenoptera devoured.

TABLE 17 - Families of Hymenoptera represented in the food of our 285 pheasants, the total number of Hymenoptera belonging to each family and used as food, and an economic summary of the insects of each family.

Family	Total number of specimens	Number of harmful specimens	Number of useful specimens	Number of neutral specimens	Number of questionable specimens
Braconidae (braconids)	2	0	0	0	2
Chalcididae (chalcid-flies)	1	0	0	0	1
Formcidae (ants)	349	349	0	0	0
Myrmicidae (ants)	3	3	0	0	0
Ichneumonidae (ichneumon flies)	4	0	2	0	2
Philanthidae (philanthid wasps)	2	0	2	0	0
Sphecidae (sphecid wasps)	1	0	1	0	0
Tenthredinidae (sawflies)	12	12	0	0	0
Family ? (ants)	15	15	0	0	0
Hymenoptera unidentified	3	0	0	0	3
Totals	392	379	5	0	8

NEUROPTERA (LACEWING FLIES) AS FOOD OF THE PHEASANT

Only nine specimens of Neuroptera were found in the food tubes of the 285 pheasants that were used in this investigation. All of the nine specimens were adults of lacewing flies (Chrysopidae) and represented two species, Chrysopa occulata Say and Chrysopa plorabunda Fitch. Since lacewing flies are useful to man, such feeding activity of the pheasants which results in the destruction of lacewing flies must be looked upon as harmful to man. Fortunately, only a small number of these beneficial insects were taken by the pheasants and, therefore, the harm done was practically negligible.

SPIDERS AS FOOD OF THE PHEASANT

Spiders do not constitute an important item in the total food consumed by pheasants. Only 30 of our 285 pheasants had spiders in their crops or gizzards and the 30 pheasants had taken a total of only 68 spiders. However, since spiders are classed as useful to man, the act of feeding upon spiders must be looked upon as harmful to man. Since only 68 spiders were found in the food tubes of our pheasants, however, the harm done by the pheasants in feeding upon spiders is practically negligible.

DIPLOPODS (MILLIPEDES OR THOUSAND-LEGGED ANIMALS) AS FOOD OF THE PHEASANT

Millipedes of several species were found in the food tubes of our pheasants, but since a total of only 15 millipedes were taken by the pheasants and only 10 pheasants had fed upon these millipedes, it must be concluded that millipedes form only a minor item in the diet of pheasants. While Mr. McAtee has classed all millipedes as economically neutral, these animals frequently are harmful in South Dakota, for they may feed upon farm, garden and greenhouse crops. However, since millipedes are used so infrequently as food by the pheasants, it must be concluded that the pheasants play only a minor part in keeping down the numbers of millipedes.

MOLLUSCA (SNAILS) AS FOOD OF THE PHEASANT

It was rather surprising to find that pheasants fed upon snails, even tho the molluscs were taken in such small numbers that they constituted a negligible item in the diet of the birds. A total of only 13 snails were used as an item of food by five of our pheasants.

GRIT IN THE CROPS AND GIZZARDS OF THE PHEASANTS

Only 33 of the crops, but all of the gizzards, of our pheasants contained stones. These stones consisted principally of small quartz pebbles, tho a small amount of calcareous matter was occasionally included. Only two crops contained stones plus a small amount of finely divided soil. In both the crops and gizzards the stones varied considerably in number, in size and in total volume.

The largest number of stones found in any one gizzard was 1,886 and these measured 4 cc. in volume, while the smallest number of stones in any one gizzard totaled 10 stones and measured 0.17 cc. in one bird and 0.1 cc. in another. The largest volume of stones in any one gizzard was 9 cc. and this included 73 stones, while the smallest volume of stones in any one gizzard was 0.17 cc. and was made up of only 10 small stones.

The average number of stones per pheasant gizzard during each month of the year is indicated in table 18, and in this same table there is indicated the average quantity of stones per pheasant gizzard for each month. For the entire year, each average gizzard contained 266.9 stones, and these totaled 3 cc. in volume. No condition or combination of conditions that we could think of explains the variations in the averages expressed in table 18.

TABLE 18 - Average number of stones and average volume of stones found in each pheasant gizzard during each month of the year.

	January	February	March	April	May	June
Average number of stones	360.1	244	275.6	368.5	318.2	235
Average volume of stones	3.76	2.57	3.01	3.45	3.16	2.95

	July	August	Sept.	Oct.	Nov.	Dec.
Average number of stones	248.6	173.7	163.2	212.4	326.7	277.3
Average volume of stones	3.42	2.43	2.17	2.47	3.19	3.38

AVERAGE MEAL OF AN AVERAGE SOUTH DAKOTA PHEASANT

If the food contents of a sufficient number of pheasant crops could be examined, identified and tabulated, and if these pheasants could be killed in sufficient numbers throughout each month of an average or normal year and if the birds could be killed after one of the two principal feeding periods of the day in all representative areas of South Dakota, then it would be possible to itemize fairly accurately the foods making up an average meal of an average South Dakota pheasant during a normal year. Undoubtedly none of the conditions enumerated obtained during this investigation, and consequently it is impossible to list the individual food items of an average meal of an average pheasant with any degree of accuracy. Further, for the same reasons it is impossible to list the quantity of any food item eaten by an average pheasant in an average meal.

In spite of the facts mentioned, an attempt was made to list the various items making up an average meal of an average pheasant taken during the course of this investigation, but the reader should remember that the writer does not claim that this average meal is composed of only these foods and in the quantity stated, but that it represents merely an approximation. That such is the case may be seen from the fact that oftentimes the gizzards of our pheasants contained materials not found in the crops of any of our birds.

In this connection it is worth while to again explain the plan that was followed by us in determining the composition of an average meal of an average pheasant. The crop contents alone of our pheasants were used for this purpose. Each separate food item was identified. Of the plant material found in the crops, only the whole seeds of plants and plant galls were considered. Plant pulp and leaves and portions of broken seeds were ignored. The same was true for animal food which consisted largely of insects. The plant and animal food ignored in the crops constituted only a very small percentage of the total crop contents, undoubtedly considerably less than one per cent.

After all of the plant and animal matter in the crops of our 285 pheasants was identified, then it was necessary to accurately determine the quantity of each different kind of animal and plant food an average pheasant ate during each month of the year. From this data it was a simple matter to compute an average meal for an average pheasant for the year.

In table 3 there is itemized the vegetable and animal matter comprising the food of our 285 pheasants, also the total number of each kind of seed, plant gall, insect, etc., found in the crops of our pheasants, and the average number of each kind of seed, plant gall, insect, etc. per pheasant crop for the year. In tables 19 and 20 we have listed what we believe to be a fairly good approximation of an average meal of an average South Dakota pheasant during a normal year. Only the plant and animal matter taken in the largest quantity is itemized, the

remainder of the material being lumped under miscellaneous vegetable or animal food. However, the miscellaneous matter is subdivided into harmful, useful and neutral materials, while an additional group was created to include the animal and vegetable matter that could not be identified or that received a questionable classification.

TABLE 19 - Average meal of plant materials of an average South Dakota pheasant based on plant food found in the crops of 285 birds taken over a period of a year.

Plant Food		
Kind of seed	Economic classification	Average number of seeds per crop
corn	useful	18.15
wheat	useful	28.1
barley	useful	20.8
oats	useful	16.3
flax	useful	4.2
rye	useful	1.64
millet	useful	1.4
wolfberry	useful	11.58
green foxtail	harmful	53.35
yellow foxtail	harmful	19.47
wild buckwehat	harmful	9.29
blue eyed grass	neutral	8.06
little ragweed	harmful	4.17
wood sorrel	neutral	3.77
wild sunflower	harmful	3.54
wild oat grass	neutral	3.24
wild oats	harmful	2.47
Russian thistle	harmful	2.14
Dakota vetch	neutral	2.16
barnyard grass	harmful	2.12
rush	neutral	1.89
violet	neutral	1.78

TABLE 19 - (Continued)

Miscellaneous seeds not included in the above		
Kind of seed	Economic classification	Average number of seeds per crop
Harmful group of species including wild barley, old witch grass, knotweed, smartweed, willow-leafed dock, lambs quarters, spreading pigweed, peppergrass, pink cleome, Missouri cactus, gaura, creeping jenny, hedge bindweed, black nightshade, buffalo bur, beggars tick, prairie thistle, prickly lettuce, dandelion.	harmful	3.20 of the entire group, and not of each species
Useful group of species including meadow foxtail, sorghum, blue stem, false timothy, proso millet, emmer, buckwheat, garden asparagus, bramble, alfalfa, sweet clover, vetch, wild grape.	useful	2.52 of the entire group and not of each species
Neutral group of species including water fern, alkali grass, switch grass, panic grass, feather grass, sedge, two-leaved Solomon seal, cinquefoil, wild rose, wild liquorice, psoralia, cut-leafed cranesbill, milky spurge, sumach, milkweed, illisia, narrow-leafed puccoon, vervain, ground cherry, wild tomato, marsh elder, small rush grass.	neutral	0.99 of the entire group and not of each species
Unidentified seeds	?	0.25

TABLE 20 - Average meal of animal matter of an average South Dakota pheasant, based on animal food found in the crops of 285 birds taken over a period of a year.

ANIMAL FOOD

Kind	Economic classification	Average number per crop
grasshoppers	harmful	1.5
crickets	harmful	0.691
ants	harmful	0.935
march flies and larvae	neutral or harmful	2.331
borborid flies	neutral	0.86
cutworms	harmful	0.311
spiders	useful	0.124
millipedes	neutral	0.020
snails	neutral or harmful	0.052
Miscellaneous insects not included in the above		
neutral beetles	neutral	0.712
harmful beetles	harmful	0.320
useful beetles	useful	0.030
beetles of questionable status	questionable	0.029
kadydids	neutral	0.043
neutral bugs	neutral	0.055
harmful bugs	harmful	0.088
useful bugs	useful	0.012
bugs of questionable status	questionable	0.027
Hymenoptera (exclusive of ants)	harmful	0.029
Hymenoptera probably useful	probably useful	0.009
neutral flies (exclusive of borborids)	neutral	0.038
useful flies	useful	0.013
flies of questionable status	questionable	0.026
moths, butterflies, caterpillars pupae that are harmful (exclusive of cutworms)	harmful	0.147
caterpillars and pupae of butterflies	neutral	0.050
Lepidoptera of questionable status	questionable	0.016
lace-wing flies	useful	0.022

A DETAILED ANALYSIS OF EACH OF THE CROP AND GIZZARD CONTENTS OF 285 SOUTH DAKOTA PHEASANTS

In the following pages of this bulletin is found a detailed analysis of the contents of each of the crops and gizzards of the 285 pheasants that were used in this investigation. Preceding the analysis of the food found in the crop and gizzard of each bird, will be found the following data: (a) the number of the bird; (b) the sex; (c) the age: (d) the date and time of day when the bird was shot; (e) the county and whenever possible, the section of the county in which the bird was taken; (f) a description of the environment in which the bird was shot; and (g) a description of the surrounding fields.

BIRD NO. 1 - Male - Adult - from southwestern Butte County. Shot April 18, 1929, at 3:30 P. M., in a weed patch in native grassland; 40 rods from nearest field which was in beets the year before.

Crop Contents

4 segments of centipede, sp?	45 kernels of barley
1 portion of body of spider, sp?	3 kernels of wheat
	2 cc. conglomerate vegetation

Gizzard Contents

1 cutworm, sp?	31 kernels of barley
0.5 cc. ground up insects	9 cc. barley hulls
	11 seeds of little ragweed, No.107

210 stones = 4.3 cc.

BIRD NO. 2 - Male - Adult - from south central Butte County. Shot May 16, 1929, at 6:30 P. M., in oat field in which grain was up about one inch. Field was in corn last year. Surrounding fields are native grass and stubble. Bird had been in oat field over an hour.

Crop Contents

37 kernels of corn
1 kernel of barley
5 kernels of wheat
2 seed pods of Missouri cactus, containing 42 seeds, No. 86
5 seeds of wild oats, No.8
0.18 cc.conglomerate vegetation

Gizzard Contents

2 beetle mandibles, No.19	7 fragments of kernels of corn
2 heads of snout-beetles, No. 89	4 seeds of Dakota vetch, No. 70
0.57 cc. ground up beetles, sp?	298 seeds of Missouri cactus, No. 86
	3 seeds of wild rose,No.66
	8.2 cc.conglomerate vegetation

216 stones = 2.5 cc.

BIRD NO. 3 - Male - Adult - from southwestern Butte County. Shot June 13, 1929, at 4:30 P. M., in alfalfa field. Bird had just left oat field in which grain was about 2 inches high.

Crop Contents

1 ant. No. 149	4 kernels of corn 0.2 cc. leaves, sp?

Gizzard Contents

2 beetle mandibles, No. 12 2 heads of snout-beetles No. 89 0.125 cc. ground up beetles sp?	2 kernels of corn 9.7 cc. ground up kernels of corn 312 seeds of two-leaved Solomon's Seal, No. 38

153 stones = 1.8 cc.

BIRD NO. 4 - Male - Adult - from southwestern Butte County. Shot June 13, 1929, at 5:00 P. M., in weeds at end of oat field in which grain was about 2 inches high. Field in wheat last year.

Crop Contents

	492 kernels of wheat 21 cc. wheat hulls

Gizzard Contents

1 ant mandible, sp? 1 beetle mandible, No.31 1 head of snout-beetle, No.89 0.1 cc. ground up beetles, sp?	88 kernels of wheat 16 cc. conglomerate vegetation

154 stones = 3.5 cc.

BIRD NO. 5 - Female - about 1 year old - from south central Butte County. Shot at 6:30 P. M., July 11, 1929, in potato patch where she had been scratching around and feeding for about 20 minutes. Surrounding fields are alfalfa and corn. Potato patch and corn fields were in wheat last year.

Crop Contents

	7 kernels of barley 30 kernels of oats 33 kernels of wheat

Gizzard Contents

38 ant heads, No.151 25 beetle mandibles, No.17 2 beetle mandibles, No.31 1 cricket mandible, No.110 7 grasshopper mandibles, sp? 0.57 cc. broken up insects, mostly ants, sp?	3 kernels of barley 30 kernels of oats 9 kernels of wheat 6.3 cc. conglomerate vegetation

299 stones = 2.7 cc.

BIRD NO. 6 - Male - Adult - from northeastern Lawrence County. Shot July 17, 1929, at 6:30 P. M., on native prairie. Bird came out of oat field, which was nearly ready for harvest. Oat field in wheat last year.

Crop Contents

1 snout-beetle, No. 89	39 kernels of wheat 67 seeds of Dakota vetch, No.70 1 seed of feather grass, No.31 3 seeds prairie thistle, No.112 1 seed of sumach, No.62 1360 seeds wild oat grass, No.13 0.3 cc. conglomerate vegetation

Gizzard Contents

2 beetle mandibles, sp? 1 head of snout-beetle, No. 89 0.25 cc. ground up beetles, sp?	1 kernel of wheat 291 seeds of Dakota vetch, No.70 3 seeds of knotweed, No.46 1 seed of legume, sp? 4 seeds of lupine, No. 72 1 seed prairie thistle, No.112 1 seed of sedge, No.35 8 seeds of sumach, No.82 1 seed of sweet clover, No.74 170 seeds wild oat grass, No.13 13 unidentified seeds 7.8 cc. conglomerate vegetation

280 stones = 4.3 cc.

BIRD NO. 7 - Male - 1 year old - from southwestern Butte County. Shot January 15, 1930, at 4:00 P. M., beside a stack of oat straw. Bird was observed for 20 minutes, scratching in the chaff. Surrounding fields had been in potatoes, corn and barley. About 5 inches of snow on the ground.

Crop Contents

770 kernels of oats
4 kernels of wheat
1 seed of alfalfa
13 seeds of green foxtail, No.27
1 seed of old-witch grass, No.19
1 seed of rough pigweed, No.52
21 seeds of sweet clover, No.74
31 seeds of wild buckwheat, No.42
6 seeds of wild oats , No.8
1 cc. conglomerate vegetation

49 stones = 0.375 cc.

Gizzard Contents

35 kernels of oats
16.5 cc. oat hulls
1 seed of little ragweed, No.107
3 seeds of sweet clover, No.74
2 seeds wild buckwheat, No.42
1 seed of wild oat, No. 8
5 seeds of wild rose, No.66

74 stones = 2.6 cc.

BIRD NO. 8 - Female - Adult - from southwestern Meade County. Shot January 28, 1930, at 7:30 A. M., in corn field in which corn had been cut with binder and hauled off. Surrounding fields were of wheat stubble and native grass.

Crop Contents

None

Gizzard Contents

20 seeds Symphoricarpos sp? No.105
45 seeds of wild rose, No.66
4 cc. conglomerate vegetation

243 stones = 2.3 cc.

BIRD NO. 9 - Male - Adult - from south central Butte County. Shot February 24, 1930, at 4:00 P. M., in a small corn field which had been fenced for hog pasture. Field to north in wheat for two seasons, corn and beets to the south and native grass on west.

Crop Contents

57 kernels of corn
19 kernels of barley
2 kernels of oats
269 kernels of wheat
1 seed Russian thistle, No.50
0.5 cc. conglomerate vegetation

Gizzard Contents

9 kernels of corn and 8 fragments
3 kernels of wheat
31 seeds of wild rose, No.66
16 cc. conglomerate vegetation

299 stones = 4.7 cc.

BIRD NO. 10 - Male - Adult - from south central Butte County. Shot March 4, 1930, at 5:15 P. M., sunning itself in corn field. All surrounding fields had been in corn the past year.

Crop Contents

197 kernels of corn
1 kernel of barley
5 kernels of oats
1 seed wild sunflower, No.114
0.5 cc. conglomerate vegetation

Gizzard Contents

4 grasshopper mandibles, sp?

0.1 cc. ground up grasshoppers, sp?

4 kernels of corn and 29 fragments
2 seeds giant ragweed, No.108
1 seed of vetch, No.77
8.5 cc. conglomerate vegetation

106 stones = 2.3 cc.

BIRD NO. 11 - Male - Adult - from southwestern Butte County. Shot March 19. 1930, at 4:15 P. M., in the edge of an alfalfa field. Bird came out of bunch of weeds on other side of the road.

Crop Contents

None

Gizzard Contents

1 kernel of oats
2 kernels of wheat
1 seed of smartweed, No.44
10 fragments of seeds of wild rose, No.66
1 seed of willow-leaved dock, No.47
8 cc.conglomerate vegetation

202 stones = 2 cc.

BIRD NO. 12 - Male - Adult - from south central Butte County. Shot March 19, 1930, at 5:15 P.M., near edge of field which had been in corn last year and which was now being seeded to wheat. All surrounding fields in corn last year. Bird was feeding for about 25 minutes before it was killed.

Crop Contents

1 kernel corn & 7 fragments
57 kernels of barley
1 kernel of oats
25 seeds of smartweed, No.44
0.05 cc. vegetation

1 very small stone

Gizzard Contents

2 sniders, No. 188

0.1 cc. insect parts, including 5 ant heads and 1 beetle head, sp?

12 fragments of kernels of corn
25 kernels of barley
1 seed of knotweed, No.46
2 seeds giant ragweed,No.108
5 seeds little ragweed,No.107
9 seeds of wild rose,No.66
21 seeds of smartweed,No.44
153 seeds wild tomato, No.100
16.5 cc. conglomerate vegetation

513 stones = 4.5 cc.

BIRD NO. 26 - Male - 1 year old - from northeastern Custer County. Shot April 27, 1929, at 6:00 P.M., on virgin sod on the bank of French Creek, about 50 yards from barley stubble. Working from the stubble toward the creek.

Crop Contents

29 ants, No.148	197 kernels of barley
1 beetle, sp?	7 cc. barley chaff
1 bug, No. 130	418 kernels of oats
	5 seeds green foxtail, No.27
	79 seeds pink cleome, No.57
	2 seeds wild sunflower, No.114

Gizzard Contents

0.25 cc. ground up insects, mostly ants, No.148	17 kernels of barley
	13 kernels of oats
	27 cc. ground up vegetation, probably barley & oats
	1 kernel of wheat
	24 seeds pink cleome, No.57
	1 gall, No. 118

220 stones = 4.7 cc.

BIRD NO. 27 - Male - Adult - from north central Pennington County. Shot May 20, 1929, at 7:00 P.M. Bird killed in edge of alfalfa field, bordered by freshly planted grain fields, which had been sown with broadcast or endgate seeder, leaving considerable grain on surface of ground. Bird came from irrigation ditch and traveled across the grain field, feeding on the way.

Crop Contents

1 beetle, No.77	1 kernel of corn
26 snout beetles, No.89	111 kernels of barley
2 bugs, No.133	5 kernels of emmer
1 caterpillar, sp?	120 kernels of oats
4 flies, No.170	1 kernel wild oats, No.8
	8 cc. alfalfa leaves

34 stones = 0.2 cc.

Gizzard Contents

19 heads and 8 snouts of snout beetles, No.89	11 kernels of barley
	1 kernel of emmer
0.29 cc. ground up insects	25 kernels of oats
	29 cc. conglomerate vegetation

508 stones = 4.8 cc.

BIRD NO.28 - Male - Adult - from east central Custer County. Shot June 24, 1929, at 6:00 P.M., on native sod, adjoining corn field. Corn about 12 inches high: field had evidently been in oats or barley the preceding year.

Crop Contents

	3 kernels of oats
	21 kernels of wheat
	1 seed Lamb's quarter, No.49
	1 seed wild buckwheat, No.42
	687 seeds wild oats, No.8
	6 cc. chaff, probably wild oats

Gizzard Contents

1 ant head, sp?	1 fragment of kernel of corn
5 beetle mandibles-1-No.31	30 kernels of oats
1 - No.85, 1 - No. 13	1 kernel of wheat
11 cricket mandibles, sp?	2 seeds wild buckwheat, No.42
6 grasshopper mandibles, sp?	56 seeds of wild oats, No.8
0.7 cc. ground up beetles crickets and grasshoppers, sp?	19.2 cc. conglomerate vegetation

349 stones = 4.2 cc.

BIRD NO.29 - Male - Adult - from north central Pennington County. Shot July 24, 1929, at 6:30 P.M., in alfalfa field. Corn, waist high, in surrounding fields. Bird came out of corn field and was catching grasshoppers at time it was killed.

Crop Contents

1 caterpillar, No.183	1 seed green foxtail, No.27
1 fly larva, sp?	0.12 cc. conglomerate vegetation
8 grasshopper nymphs, No.107	
2 grasshipper mandibles, sp?	
1.4 cc. broken up grasshoppers, sp?	

Gizzard Contents

3 beetle mandibles, sp?	17 pits choke cherry, No.64
1 caterpillar head, sp?	13 seeds, green foxtail, No.27
1 caterpillar mandible, sp?	2 seeds wild buckwheat, No.42
3 grasshopper heads, sp?	6.2 cc. conglomerate vegetation
31 grasshopper mandibles, sp?	
5 cc. ground up grasshoppers & caterpillars, sp?	

232 stones = 3.5 cc.

BIRD NO.30 - Male - Adult - from central Pennington County. Shot August 24, 1929, at 5:00 P.M., in wheat stubble from which grain had been threshed about a week before. Corn field on one side and native grass on other sides of stubble. This bird had only one leg.

Crop Contents

1 click-beetle, No.67	2 kernels of barley
7 grasshoppers	22 kernels of oats
1 - No.98	398 kernels of wheat
3 - No.101	5.2 cc. wheat chaff
3 - No.103	1 seed wild buckwheat, No.42

Gizzard Contents

1 beetle mandible, No.17	1 seed of knotweed, No.46
2 grasshopper heads, sp?	26 seeds of sedge, No.35
140 grasshopper mandibles, sp?	102 seeds wild buckwheat, No.42
6.6 cc. ground up grasshoppers, sp?	4.1 cc. conglomerate vegetation

69 stones = 1.2 cc.

BIRD NO.31 - Male - Adult - from central Pennington County. Shot September 2, 1929, at 6:00 P.M., in a native grass pasture. Surrounding fields were hay land, alfalfa and native grass, with a field of small grain stubble across the road.

Crop Contents

1 grasshopper, No.103	116 kernels of corn
	14 kernels of barley
	2 seeds of alfalfa
	3 seeds buffalo bur, No.99
	1 seed little ragweed, No.107
	1 seed prairie thistle, No.112
	43 seeds wild sunflower, No.114
	1.3 cc. vegetation

Gizzard Contents

15 grasshopper mandibles, sp?	8 kernels corn & 17 fragments
0.7 cc. ground up grasshoppers, sp?	33 seeds buffalo bur, No.99
	14 seeds giant ragweed, No.108
	1 seed lamb's quarters, No.49
	1 seed prairie thistle, No.112
	2 seeds sweet clover, No.74
	7 seeds wild buckwheat, No.42
	42 seeds wild sunflower, No.114
	13.6 cc. conglomerate vegetation

77 stones = 3.1 cc.

BIRD NO. 32 - Female - Adult - from east central Custer County. Shot September 11, 1929, at 5:00 P.M., in a native grass pasture near a creek. Alfalfa fields and small grain stubble surrounded the pasture.

Crop Contents

43 grasshoppers	7 kernels of barley
10 - No. 101	2 kernels of oats
1 - No. 102	457 kernels of wheat
29 - No. 103	1 seed of wild oats, No.8
1 - No. 107	3 seeds wild sunflower, No.114
2 - No.109	1.5 cc. alfalfa leaves

Gizzard Contents

8 heads, 90 mandibles of grasshoppers, sp?	30 kernels of wheat
8.3 cc. broken up grasshoppers, sp?	3 seeds of gaura, No.87
	7 seeds giant ragweed, No.108
	6 seeds of knotweed, No.46
	18 seeds wild buckwheat, No.42
	5 seeds wild rose, No.66
	6 seeds wild sunflower, No.114
	8.9 cc. conglomerate vegetation

179 stones = 1.4 cc.

BIRD NO.33 - Male - Adult - from northeastern Fall River County. Shot September 14, 1929, at 3:30 P.M., in alfalfa stubble surrounded by alfalfa and native grass.

Crop Contents

5 crickets, No.110	4 seeds of gaura, No.87
103 grasshoppers	1 seed of knotweed, No.46
5 - No. 98: 1 - No.102	406 seeds little ragweed, No.107
92 - No.103: 5 - No.109	2 seeds wild barley, No.17
1 katydid, No.114	1.5 cc. vegetation
1 leaf hopper, No.119	
0.33 cc. ground up grasshoppers, sp?	

Gizzard Contents

2 heads and 1 mandible of cricket, sp?	8 seeds of gaura, No.87
6 heads and 73 mandibles of grasshoppers, sp?	15 seeds of knotweed, No.46
7.2 cc. ground up crickets and grasshoppers, sp?	11 seeds giant ragweed, No.108
	286 seeds little ragweed, No.107
	2 seeds of sedge, No.35
	7.3 cc. conglomerate vegetation

93 stones = 1.2 cc.

BIRD NO.34 - Female - Adult - from north central Pennington County. Shot December 28, 1929, at 4:00 P.M., in alfalfa stubble. No snow on ground. Corn fields, unpicked, on two sides: native grass pasture with weed patches on other sides. This bird with several others appeared to be working out of the corn fields.

Crop Contents

89 kernels corn & 31 fragments
146 kernels of barley
1 kernel of emmer
5 kernels of oats
2 kernels of wheat
1 seed of sweet clover, No.74
3 cc grass leaves and stems

31 stones = 0.1 cc.

Gizzard Contents

5 kernels corn & 22 fragments
8 kernels of barley
1 seed of alfalfa
34 seeds sweet clover, No.74
15 cc. conglomerate vegetation

328 stones = 3.7 cc.

BIRD NO.35 - Male - Adult - from northeastern Custer County. Shot January 12, 1930, at 3:00 P.M., in clump of trees in edge of alfalfa field. Corn field with cattle in it on one side, native grass land with weeds and creek on other side. Bird huddled up in shelter of trees out of cold, and did not move during period of observation. Corn field (picked) & wild hay stubble on remaining side.

Crop Contents

70 kernels of corn & 9 fragments
3 kernels of barley
2 kernels of emmer
2 seeds wild sunflower, No.114
0.7 cc. vegetation

Gizzard Contents

3 kernels corn & 9 fragments
1 seed giant ragweed, No.108
9.7 cc. conglomerate vegetation

228 stones = 3 cc.

BIRD NO.36 - Male - Adult - from central Pennington County. Shot January 24, 1930, at 5:30 P.M., in hay stubble. Pasture and alfalfa hay ground on two sides, beet field on third and corn field (unpicked) across the road on fourth side.

Crop Contents

1 kernel of corn
1 kernel of barley
18 kernels of oats
1 kernel of wheat
2.5 cc. straw

Gizzard Contents

3 grasshopper mandibles, sp?
0.38 cc. ground up grasshoppers, sp?
1 kernel of corn
2 kernels of barley
17 kernels of oats
1 seed giant ragweed, No.108
83 seeds wild rose and 5 fragments, No.66
14 cc. conglomerate vegetation

455 stones = 6.5 cc.

BIRD NO.37 - Female - Mature - from northeastern Fall River County. Shot February 14, 1930, at 1 P.M., in thicket of sweet clover and wild sunflowers along a creek. Corn fields on two sides; alfalfa on other two.

Crop Contents

None

Gizzard Contents

3 seeds lamb's quarters, No.49
13 seeds saltbush, No.48
0.3 cc. saltbush hulls, No.48
5 cc. conglomerate vegetation

397 stones = 2.5 cc.

BIRD NO.38 - Male - Adult - from central Pennington County. Shot February 21, 1930, at 6:00 P.M. in an alfalfa field. Ground mostly bare of snow. Native grass pasture and small grain stubble on three sides of the field.

Crop Contents

None

Gizzard Contents

12 cc. barley hulls
1 seed knotweed, No.46
6 seeds giant ragweed, No. 108
1 seed wild rose and two fragments, No.66

190 stones = 2.5 cc.

BIRD NO.39 - Female - Adult - from central Pennington County. Shot March 5, 1930, at 4:30 P.M., in a native hay field near a small creek: weeds abundant. Surrounding fields: alfalfa and native grass land. Nearest corn field one-half mile away. Bird coming from direction of corn field.

Crop Contents

36 grasshopper eggs	28 kernels of corn & 28 fragments 26 kernels of barley and two fragments 8 kernels of emmer 7 kernels of oats 7 kernels of wheat 2.5 cc. leaves, sp?

Gizzard Contents

2 grasshopper mandibles, sp? 0.1 cc. insect parts, chiefly grasshoppers & beetles	4 kernels corn & 11 fragments 10 kernels of barley 8 seeds giant ragweed, No.108 10.5 cc. conglomerate vegetation

136 stones = 2.5 cc.

BIRD NO.40 - Male - Adult - from north central Pennington County. Shot March 30, 1930, at 3:30 P.M., in barley stubble. Corn field across road: slough and wild grass on other sides.

Crop Contents

1 beetle, No.13	23 kernels corn & 9 fragments 516 kernels of barley 0.1 cc. broken grains, barley 74 seeds little ragweed, No.107 1 seed sweet clover, No.74 21 seeds wild sunflower, No.114 1 rose leaf, No. 66 bits milkweed leaves, No.88

Gizzard Contents

2 grasshopper mandibles, sp? 0.15 cc. ground up beetles and grasshoppers, sp?	3 kernels of corn 3 kernels of barley 6 seeds giant ragweed, No.108 235 seeds little ragweed, No.107 4 seeds of smartweed, No.44 1 seed of vetch, No.77 1 seed wild cucumber and 1 fragment, No.106 2 seeds wild rose, No.66 5 seeds wild sunflower, No.114 15.5 cc. conglomerate vegetation

143 stones = 3.25 cc.

BIRD NO. 51 - Male - Adult - from northeastern Beadle County. Shot March 26, 1929, at 10:00 A.M., on a hay meadow about 70 feet from highway, within range of corn and wheat.

Crop Contents

5 grasshoppers	160 seeds of flax
	1 kernel of oats
4 - No. 107	358 kernels of wheat
1 - No. 101	1 seed lamb's quarter, No.49
	1 seed sweet clover, No.74
	2 seeds wild buckwheat, No.42
	2 cc. conglomerate vegetation

84 stones = 0.02 cc.

Gizzard Contents

1 cricket head, No.110	5 seeds of flax
many parts of Hymenopteron body, sp?	68 kernels of wheat
	1 seed bindweed, No.90
	1 seed Dakota vetch, No.70
	1 seed sweet clover, No.74
	6 seeds wild buckwheat, No.42
	19 unidentified seeds

242 stones = 3.6 cc.

BIRD NO.52 - Male - Adult - from central Beadle County. Shot March 26, 1929, at 2:00 P.M. in wheat field.

Crop Contents

None

Gizzard Contents

78 grasshopper mandibles and parts of bodies of crickets, grasshoppers and beetles, sp?	13 seeds of flax
	1 seed yellow foxtail, No.25
	17 seeds sweet clover, No.74
	4 seeds wild buckwheat, No.42
	6 unidentified seeds
	11.4 cc. conglomerate vegetation

705 stones = 4 cc.

BIRD NO.53 - Male - Adult - from south central Beadle County. Shot April 12, 1929, at 5:00 P.M., in a corn field. Surrounding fields: millet, wheat, oats and corn.

Crop Contents

1 grasshopper, No.108	50 kernels of corn
	1 seed green foxtail, No.27
	2 seeds yellow foxtail, No.25
	1 seed rough pigweed, No. 52
	0.17 cc. vegetation

Gizzard Contents

1 beetle mandible, No.17	4 kernels corn & 23 fragments
0.1 cc. bits of beetle, No.17	2 seeds yellow foxtail, No.25
	39 seeds wild rose, No.66
	6.5 cc. conglomerate vegetation

251 stones = 2.6 cc.

BIRD NO.55 - Male - Adult - from south central Beadle County. Shot April 20, 1929, at 5:30 P.M., in a corn field. Hay meadows surrounding the field.

Crop Contents

1 beetle, No. 17 | Few bits of vegetation

Gizzard Contents

4 heads and body parts of beetles, No. 17
33 beetle mandibles, No.13
1 cc.ground up beetles,No.13
9 fragments of kernels of corn
2 seeds wild buckwheat,No.42
1 seed wild rose, No.66
292 stones = 2.8 cc.

BIRD NO.54 - Female - Adult - from south central Beadle County. Shot April 20, 1929 at 5:30 P.M., in corn field. Surrounding fields: native grass land.

Crop Contents

2 beetles, No. 17
1 beetle abdomen,No.20
1 cutworm, sp?
285 March fly larvae,No.165
Parts of grasshopper (last year's insect)
6 kernels of corn
222 seeds green foxtail,No.27
7 seeds yellow foxtail,No.25
1 seed wild buckwheat,No.42
1 cc. grass leaves
1 stone = 0.03 cc.

Gizzard Contents

109 beetle mandibles,No.13
1 beetle larva,No. 13
9 beetle heads & body parts
8 - No.17: 1 - sp?
1.67 ground up beetles & grasshoppers, sp?
5 kernels of corn
303 seeds green foxtail,No.27
293 seeds,yellow foxtail,No.25
11 seeds wild buckwheat, No. 42
7 cc.conglomerate vegetation
608 stones = 3.5 cc.

BIRD NO.56 - Male - Adult - from north central Beadle County. Shot April 26, 1929, at 3:30 P.M., in a pasture bordered by fields of wheat, oats and barley stubble.

Crop Contents

6 seeds wild buckwheat, No.42
0.11 cc. vegetation
1 unidentified seed

Gizzard Contents

3 beetles
2 - No. 17
1 - No. 35
bits of beetle, No. 5
0.75 cc. ground up beetles and one grasshopper leg, sp?
1 beetle head, No. 63
97 seeds wild buckwheat,No.42
27 spikelets buffalo grass,No.12
2 seeds Dakota vetch,No.70
1 seed narrow-leaved puccoon, No. 93
1 seed little ragweed,No.107
1 seed wild sunflower,No.114
2 unidentified seeds
5.6 cc.conglomerate vegetation
309 stones = 3.cc.

BIRD NO. 57 - Male - Adult - from central Beadle County. Shot May 7, 1929 at 4:00 P. M., in a wheat field, surrounded by fields of alfalfa, wheat, oats, barley and sloughs.

Crop Contents

7 kernels of corn

Gizzard Contents

1 beetle ground into bits, No.13
364 stones = 3.2 cc.

11.5 cc. conglomerate vegetation

BIRD NO. 58 - Male - Adult - from north central Beadle County. Shot May 22, 1929, at 4:30 P.M., in pasture land, surrounded by fields of small grains.

Crop Contents

19 kernels of barley
5 kernels of oats
1 seed yellow foxtail, No.25
4 unidentified seeds
0.11 cc. conglomerate vegetation

Gizzard Contents

1 snout beetle, No. 89
1 beetle head, sp?
2 beetle mandibles, No.14
0.14 cc. ground up beetles, sp?

27 kernels of barley
1 kernel of oats
13.5 cc. oat hulls
4 seeds Dakota vetch, No.70
20 seeds of sedge, No. 35
2 seeds wild buckwheat, No.42
4 seeds wild rose, No. 66

393 stones = 3.1 cc.

BIRD NO. 59 - Male - Adult - from north central Beadle County. Shot May 29, 1929, at 3:30 P.M., in a wheat field, surrounded by fields of alfalfa, clover, wheat, oats, barley and pasture land.

Crop Contents

None

Gizzard Contents

50 beetle mandibles, sp?
0.43 cc. ground up beetles
1 fly, No. 165

1 kernel of barley
1 kernel of wheat
13 cc. conglomerate vegetation

921 stones = 4.4 cc.

BIRD NO. 60 - Male - Adult - from southeastern Beadle County. Shot May 31, 1929, at 8:00 P.M., in a corn field surrounded by fields of small grains, alfalfa and corn. Killed on complaint of farmer who said it was eating corn. Corn was 4 inches high.

Crop Contents

38 cutworms, sp?
1 spider, No. 188

61 kernels of corn, not sprouted
6 kernels of barley
21 kernels of oats
1 kernel of wheat
0.5 cc. conglomerate vegetation

Gizzard Contents

1 head & 2 mandibles of ants, sp?
1 head of snout beetle, sp?
2 beetle mandibles, No. 17
25 cutworms, sp?
5 heads, 16 mandibles of cutworms, sp?
0.25 cc. ground up beetles and cutworms, sp?

4 kernels corn & 14 fragments
1 kernel of barley
5 kernels of oats
4 seeds, yellow foxtail, No. 25
5 unidentified seeds
13.5 cc. conglomerate vegetation

357 stones = 3.3 cc.

BIRD NO. 61 - Male - Adult - from southeastern Beadle County. Shot May 31, 1929, at 8:15 P.M., in a pasture adjoining a field of corn which the farmer claimed had been damaged by pheasants. Corn was about 4 inches high. Surrounding fields were of alfafla, oats, barley and wheat.

Crop Contents

1 beetle, No. 77
3 small bits of beetle, sp?
3 cutworms, sp?

21 kernels corn, not sprouted
1 kernel of oats
1 seed wild buckwheat, No. 42
2 seeds yellow foxtail, No. 25
2 seeds of sedge, No. 35

Gizzard Contents

1 ant head, sp?
2 heads, 12 mandibles of cutworms, sp?
0.2 cc. ground up ants and cutworms, sp?

2 kernels corn, not sprouted
2 kernels of oats
1 seed Dakota vetch, No. 70
1 seed yellow foxtail, No. 25
10.5 cc. conglomerate vegetation

182 stones = 2.7 cc.

BIRD NO. 62 - Male - Adult - from north central Beadle County. Shot June 12, 1929, at 3:30 P.M., in a wheat field.

Crop Contents

None

Gizzard Contents

1 head, 22 mandibles of beetles, No. 13	14 kernels of emmer
0.5 cc. ground up beetles, No. 13	14 cc. emmer hulls
1 cutworm mandible, sp?	1 seed wild rose, No. 66

267 stones = 2.5 cc.

BIRD NO.63 -Male - Adult - from southeastern Spink County. Shot June 12, 1929, at 4:00 P.M., in a pasture surrounded by fields of corn, wheat and oats.

Crop Contents

None

Gizzard Contents

2 ants, No. 149	18 seeds Dakota vetch, No.70
29 ant heads, No. 146	1 seed of vetch, No. 77
3 snout beetles, No. 89	2 seeds wild buckwheat, No.42
35 beetle mandibles, No. 17	1 seed wild rose, No. 66
3 cutworms, sp?	13 unidentified seeds
6 cutworm mandibles, sp?	13.5 cc. conglomerate vegetation
5 grasshopper mandibles, sp?	
1.2 ground up beetles and ants, sp?	

303 stones = 3.1 cc.

BIRD NO.64 - Male - Adult - from north central Beadle County. Shot June 12, 1929, at 4:30 P.M., in a corn field. Alfalfa, corn and wheat fields adjoining this field.

Crop Contents

2 beetles	16 kernels of corn and 3.5 cc. of fragments
1 - No. 20	1 kernel of barley
1 - No. 17	Few bits of vegetation

(Bird 64 continued on following page)

(BIRD No.64 - continued)

Gizzard Contents

11 ant heads, sp?
1 snout beetle, No. 89
1 head, snout beetle, sp?
2 beetle heads: 1 -No.17; 1 - sp?
47 beetle mandibles: 1 -No.5; 4 - sp?; 42 - No. 17
1 cutworm, sp?
6 cutworm mandibles, sp?
0.4 cc. ground up beetles and ants, sp?
1 oat hull
3 kernels of wheat
4 seeds Dakota vetch, No.70
6 seeds yellow foxtail, No.25
2 seeds green foxtail, No.27
3 seeds of sedge, No. 35
300 seeds two-leaved Solomon's seal, No. 38
3 seeds wild buckwheat, No.42
2 seeds wild rose, No. 66
1 seed willow-leaved dock, No.47
9.4 cc. conglomerate vegetation

590 stones = 2.7 cc.

BIRD NO.65 - Male - Adult - from southeastern Spink County. Shot June 21, 1929, at 5:30 P.M., in a wheat field. Adjoining the wheat field were fields of alfalfa, oats, wheat and a large grove. Bird was feeding in grass but ran for the wheat field on approach of the warden.

Crop Contents

25 seeds panic grass, No.22
13 seeds Dakota vetch, No.70

Gizzard Contents

1 head of snout beetle, sp?
29 beetle mandibles, No. 17
1 cc. ground up beetles, sp?
1 bug, sp?
2 bugs heads, sp?
3 caterpillar mandibles, sp?
3 grasshopper mandibles, sp?
44 seeds knotweed, No.46
182 seeds panic grass, No.22
218 seeds two-leaved Solomon's seal, No. 38
176 seeds Dakota vetch, No.70
1 seed milk vetch No.68
1 seed wild buckwheat, No.42
2 seeds wild rose, No.66
3.5 cc. conglomerate vegetation

173 stones = 3.5 cc.

BIRD NO.66 - Male - Adult - from Spink County. Shot July 13, 1929, at 4:00 P. M., in a pasture surrounded by fields of alfalfa, corn, wheat, oats and barley.

Crop Contents

36 kernels of barley
4 kernels of oats
0.3 cc.conglomerate vegetation

Gizzard Contents

2 beetle mandibles
1 - No.14: 1 - No.17
0.05 cc.ground up beetles,sp?
1 caterpillar mandible,sp?
15 kernels of barley
8 kernels of oats
3 seeds wild rose,No.66
17.9cc.conglomerate vegetation

239 stones = 3.8 cc.

BIRD NO.67 - Female - Adult - from central Beadle County. Shot July 31, 1929, at 7:45 P.M. in an oat field with barley, wheat and corn fields adjoining. Bird was catching insects.

Crop Contents

9 grasshoppers
1 - No.97: 8 - No.107
2 katydids, No.116
11 kernels of barley
3 seeds yellow foxtail,No.25
0.6 cc.conglomerate vegetation

1 stone

Gizzard Contents

1 beetle mandible, No.17
1 cricket head, sp?
2 grasshoppers
1 - No. 101
1 - No. 107
6 heads and 43 mandibles of grasshoppers, sp?
2 cc.ground up grasshoppers, sp?
10 kernels of barley
394 seeds green foxtail, No.27
1 seed Dakota vetch, No.70
12 cc.conglomerate vegetation

147 stones = 3.3 cc.

BIRD NO.68 - Female - Adult - from Beadle County. Shot August 2, 1929, at 7:45 P.M., in a tomato patch within the city limits of Huron. This bird was killed on a market gardener's place, and on his complaint that the bird was doing damage. Adjoining the tomato patch were onions, cabbages, radishes and parsnips.

Crop Contents

12 beetles
4 - No.45: 6 - No.34
1 - No.29: 1 - No.43
1 beetle head, No.35
1 beetle pupa, No.27
1 fly, No. 173
9 grasshoppers: 1 - No.101
7 - No.107: 1 - No.108
1 spider, No.188

154 seeds green foxtail, No.27
532 seeds yellow foxtail, No.25
2.5 cc. conglomerate vegetation

Gizzard Contents

1 beetle, No.34
12 beetle heads, No.34
1 beetle head & thorax, No. 35
0.9 cc. broken up beetles, mostly No. 34
2 caterpillar mandibles, sp?
44 grasshopper mandibles, sp?

6 seeds bindweed, No.90
2 chokecherry pits, No.64
62 seeds green foxtail, No.27
677 seeds yellow foxtail, No.25
3 melon seeds, sp?
1 seed wild rose, No.66
9.5 cc. conglomerate vegetation

161 stones = 1.5 cc.

BIRD NO.69 - Female - Adult - from south central Spink County. Shot August 5, 1929, at 7:30 P.M., in an oat field which was in wheat last year. Surrounding fields were of corn, oats, barley and pasture land.

Crop Contents

4 spiders, No. 188
1 tree hopper, No. 126

12 kernels of rye
3 kernels of wheat
1 seed barnyard grass, No.16
970 seeds green foxtail, No.27
6 seeds yellow foxtail, No.25
0.3 cc. conglomerate vegetation

20 stones

Gizzard Contents

4 beetle mandibles
3 - No.17: 1 - sp?
1 grasshopper, sp?
1 katydid, No. 117
19 grasshopper mandibles, sp?
1.2 cc. ground up spiders and grasshoppers, sp?

3 kernels of barley
5 kernels of wheat
10 seeds barnyard grass, No.16
651 seeds green foxtail, No.27
116 seeds yellow foxtail, No.25
1 seed Dakota vetch, No.70
8.7 cc. conglomerate vegetation

259 stones = 1.5 cc.

BIRD NO. 70 - Sex unknown - Young - from south central Spink County. Shot August 5, 1929, at 7:00 P.M., in a wheat field. Surrounding fields were in corn, wheat and barley.

Crop Contents

1 snout beetle, No. 89	17 kernels of wheat
1 bug, No. 122	1 seed barnyard grass, No.16
2 grasshoppers, No.106	5 seeds green foxtail, No. 27
4 tree crickets, No.112	1 seed yellow foxtail, No. 25
	3 seeds spreading pigweed, No.51

Gizzard Contents

1 ant head, sp?	14 kernels of wheat
1 head snout beetle, No.89	12 seeds barnyard grass, No.16
1 tiger beetle, No.58	7 seeds green foxtail, No. 27
1 beetle head, sp?	94 seeds yellow foxtail, No.25
1 caterpillar head, sp?	3 seeds knotweed, No. 46
1 cricket head, sp?	4 seeds spreading pigweed, No.51
5 heads and 35 mandibles of grasshoppers, sp?	4.1 cc. conglomerate vegetation
2.4 cc. ground up beetles and grasshoppers, sp?	

62 stones = 1 cc.

BIRD NO.71 - Female - Adult - from central Beadle County. Shot August 19, 1929, at 7:30 P.M., in a wheat field. Small grain, sweet clover, alfalfa and corn in adjoining fields.

Crop Contents

1 bug, No. 121	1 kernel of oats
1 bug, No. 135	91 kernels of wheat
1 bug, sp?	0.17 cc. conglomerate vegetation

Gizzard Contents

3 beetle mandibles, sp?	59 kernels of wheat
1 robber fly, No. 164	5 seeds of green foxtail, No.27
2 heads and 17 mandibles of grasshoppers, sp?	94 seeds yellow foxtail, No.25
4 cc. broken up spiders, flies & grasshoppers, sp?	8 cc. conglomerate vegetation
	7 galls, No. 118

105 stones = 1.2 cc.

BIRD NO.72 - Sex unknown -Young - from central Beadle County. Shot August 21, 1929, at 6:45 P.M., in a pasture surrounded by fields of wheat, corn, oats and alfalfa.

Crop Contents

None

Gizzard Contents

2 heads and 9 mandibles of grasshoppers, sp?	86 seeds green foxtail, No.27
2.5 cc. ground up grasshoppers, sp?	114 seeds yellow foxtail, No.25
	15 seeds wild buckwheat, No.42
	1 seed wild rose, No. 66
	3.7 cc. conglomerate vegetation

104 stones = 1.7 cc.

BIRD NO.73 - Male - Adult - from southeastern Marshall County. Shot October 12, 1929, at 11:00 A. M., in wheat field. Adjoining areas were of small grain and prairie.

Crop Contents

1 grasshopper, No. 104	2 kernels of barley
	915 kernels of wheat
	2 seeds green foxtail, No. 27
	1 seed wild buckwheat, No. 42
	10 cc. conglomerate vegetation, including some wheat chaff

Gizzard Contents

7 caterpillar mandibles, sp?	6 fragments kernels of corn
9 heads and 4 mandibles of grasshoppers, sp?	70 kernels of wheat
	11 seeds of hawthorn, No.60
4 cc. broken up grasshoppers, sp?	75 seeds wild rose, No.66
	3 seeds wolfberry, No. 104
	14.8 cc. conglomerate vegetation

187 stones = 1.8 cc.

BIRD NO. 74 - Male - Adult - from west central Roberts County. Shot October 13, 1929, at 2:30 P.M., on prairie adjoining small grain fields.

Crop Contents

None

Gizzard Contents

4 grasshopper mandibles, sp?	4 seeds of legume, sp?
0.1 cc. ground up beetles and grasshoppers, sp?	3 seeds of pondweed, No.3
	27 seeds wild grape, No.84
	61 seeds wolfberry, No.104
	9.5 cc. conglomerate vegetation

88 stones = 1 cc.

BIRD NO.75 - Female - Adult - from southeastern Marshall County. Shot February 2, 1930, at 3:00 P.M., in timber land around Red Iron Lake. Surrounding fields were of corn, some of which was shocked and some stacked.

Crop Contents

85 kernels of corn

Gizzard Contents

1 kernel corn & 34 fragments
6.5 cc. ground up corn
23 seeds wild rose, No.66
53 seeds wolfberry, No.104

154 stones = 1.5 cc.

BIRD NO.76 - Male - Adult - from northeastern Marshall County. Shot February 14, 1930, at 4:30 P.M., near the edge of a slough. Fields of small grain and corn a mile away.

Crop Contents

10 kernels of barley
10 kernels of oats
127 kernels of wheat
30 seeds of wild oats, No.8
157 fruits of wolfberry, No.104, containing 314 seeds

19 stones = 0.2 cc.

Gizzard Contents

1 kernel of barley
31 kernels of wheat
5 seeds of bindweed, No.90
6 seeds wild oats, No. 8
6 seeds wild rose, No.66
824 seeds wolfberry, No.104
15 cc.conglomerate vegetation

104 stones = 2.2 cc.

BIRD NO.101 - Male - Adult - from northwestern Hughes County. Shot April 11, 1929, at 10:00 A.M., in wheat stubble, surrounded by barley stubble, native grass and a small grove.

Crop Contents

1 beetle, No. 17	17 kernels of corn
1 piece of millipede,sp?	25 kernels of wheat
	14 seeds green foxtail,No.27
	1 seed sweet clover, No.74
	0.6 cc. leaves and chaff

Gizzard Contents

1 beetle,sp?	3 kernels corn & 8 fragments
2 mandibles and parts of body of grasshopper of last year, sp?	8 kernels of wheat
	1 seed green foxtail,No.27
	2 seeds psoralea, No.75
	4 unidentified seeds
	16 cc.conglomerate vegetation

181 stones = 3 cc.

BIRD NO.102 - Male - Adult - from west central Sully County. Shot April 13, 1929, at 10:30 A.M., in wheat stubble; corn and native grass across the road.

Crop Contents

	11 kernels of wheat
	0.5 cc. wheat chaff

Gizzard Contents

1 large wasp,ground up, sp?	22 kernels of wheat
	1 seed wild buckwheat,No.42
	10.3 wheat chaff and bran

184 stones = 4 cc.

BIRD NO.103 - Male - Adult - from southeastern Sully County. Shot April 18, 1929, at 4:10 P.M., on land which had gone back to sod. Plowed land, wheat and barley stubble all within 10 rods of this land.

Crop Contents

None

Gizzard Contents

1 cricket nymph,No.110	1 plum pit, No.62
	6 cc.conglomerate vegetation

176 stones = 3.4 cc.

BIRD NO.104 - Female - Adult - from northwestern Hughes County. Shot April 22, 1929, at 5:30 P.M., on plowed field. Surrounding fields: corn stubble, wheat stubble and prairie.

Crop Contents

6 beetles	4 kernels of wheat
3 - No. 23	1 seed green foxtail, No.27
2 - No. 17	1 seed yellow foxtail, No.25
1 - No. 7	1 seed knotweed, No. 46
247 March fly larvae, No.165	2 seeds wild sunflower, No.114
	2 unidentified seeds
	3.5 cc. conglomerate vegetation

Gizzard Contents

2 beetles & 1 head, No.17	1 kernel of wheat
30 March fly larvae, No.165	3.5 cc. conglomerate vegetation
2.3 cc. ground up beetles and moths, sp?	

63 stones = 4.9 cc.

BIRD NO.105 - Male - Adult - from south central Douglas County. Shot April 29, 1929, at 4:00 P.M., on prairie, adjoining corn, barley and wheat stubble. Bird shot by game law violator.

Crop Contents

51 kernels of corn
14 kernels of barley
10 kernels of wheat

Gizzard Contents

0.2 cc. broken up beetle, sp?	6 kernels corn & 18 fragments
	7.5 cc. corn bran
	2 seeds Dakota vetch, No.70

258 stones = 3.8 cc.

BIRD NO.106 - Male - Adult - from central Sully County. Shot May 7, 1929, at 5:30 P.M., on prairie near highway. Wheat stubble, sown back to wheat, on two sides; grain about 3 inches high. A plowed field and prairie grass on other two sides.

Crop Contents

42 kernels of wheat
2 pieces of grass leaves

Gizzard Contents

1 snout beetle, No.89	67 kernels of wheat
1 beetle, No. 13	10 cc. wheat hulls and bran
2 beetle mandibles, No.19	5 seeds Dakota vetch, No.70
	1 seed of vetch, No.77
	15 seeds wild buckwheat, No.42

221 stones = 3.3 cc.

BIRD NO.107 - Male - Adult - from central Hughes County. Shot May 18, 1929, at 7:30 P.M., in wheat stubble field not used this season.

Crop Contents

1 unidentified seed

Gizzard Contents

43 mandibles of beetles
2 - sp? 41 - No. 19
4 cc.ground up beetles,sp?
1 Ichneumon fly, No.153
24 kernels of wheat
4.2 cc. wheat hulls and bran
1 seed wild buckwheat,No.42
219 stones = 2.3 cc.

BIRD NO.108 - Male - Adult - from Hughes County. Shot May 22, 1929, at 7:00 P.M., in level, open country. Surrounding fields all sown to wheat--grain about 2 inches high.

Crop Contents

1.8 cc.conglomerate vegetation

Gizzard Contents

2 ant heads, sp?
3 beetle heads: 1 - No.87
1 - No.19: 1 - sp?
2 beetle mandibles
1 - No. 87: 1 - No.11
2 cc.broken up beetles,sp?
2 kernels of barley
26 kernels of wheat
4.5 cc.conglomerate vegetation
180 stones = 2.8 cc.

BIRD NO.109 - Male - Adult - from southwestern Sully County. Shot June 4, 1929, at 5:45 P.M., on native grass land. Flax, two inches high, on other side of road. Bird had been feeding in the flax field.

Crop Contents

1 beetle, No. 18

Gizzard Contents

3 beetles: 1 - No.68
1 - No.17: 1 - No.30
19 beetle mandibles
15 - No. 19: 1 - No.12
2 - No. 31: 1 - No.17
4 cricket mandibles, sp?
30 grasshopper mandibles,sp?
2.4 cc. ground up beetles, grasshoppers & crickets,sp?
109 seeds two-leaved Solomon's seal, No. 38
1 unidentified seed
2.4 cc.conglomerate vegetation
71 stones = 2.5 cc.

BIRD NO.110 - Male - Adult - from west central Sully County. Shot June 7, 1929, at 6:30 P.M., on highway. Wheat field 6 inches high on one side of road. This field was in wheat last year also.

Crop Contents

2 kernels of wheat
270 seeds meadow foxtail, No.5

Gizzard Contents

4 snout beetles, No. 89
1 head and 3 mandibles of beetles, No. 56
8 beetle mandibles, No.13
1.6 cc.ground up beetles,sp?
6 caterpillar mandibles,sp?
12 cricket mandibles, sp?
2 grasshopper mandibles,sp?
4 kernels of wheat
171 seeds meadow foxtail, No.5
8.6 cc.meadow foxtail hulls. No. 5
37 seeds two-leaved Solomon's seal, No. 38
101 seeds of gilia, sp?, No.91
270 stones = 3.2 cc.

BIRD NO.111 - Male - Adult - from north central Hughes County. Shot June 24, 1929, at 6:30 P.M., near highway along edge of wheat field in which grain was 18 inches high. Barley field across road: corn field 10 rods distant which was in wheat last year and was hailed out.

Crop Contents

64 kernels of wheat
2 cc. wheat chaff

Gizzard Contents

3 beetle mandibles, sp?
20 cricket mandibles,No.110
1.3 cc. ground up beetles and crickets, sp?
15 kernels of wheat
54 seeds two-leaved Solomon's seal, No. 38
11.5 cc.conglomerate vegetation
120 stones = 2.3 cc.

BIRD NO.112 - Female - Adult - from southeastern Sully County. Shot June 28, 1929, at 5:30 P.M., in a millet field with grain 3 inches high. Neighboring fields of wheat (14 inches high), alfalfa and corn.

Crop Contents

0.2 cc. vegetation

Gizzard Contents

1 beetle head, sp?
13 beetle mandibles
8 - No.85: 2 - No.17
2 - sp? 1 - No.56
11 cricket mandibles, sp?
39 grasshopper mandibles,sp?
0.8 cc.ground up beetles and caterpillars,sp?
3 seeds two-leaved Solomon's seal, No. 38
11 cc.conglomerate vegetation
149 stones = 2.cc.

BIRD NO.113 - Male - Adult - from south central Sully County. Shot July 2, 1929, at 6:30 P.M., along highway. Fields of wheat, barley, corn and native prairie nearby.

Crop Contents

None

Gizzard Contents

1 head & thorax of ant, sp?
1 snout beetle, No.38
2 leaf beetles, No.56
1 head and 6 mandibles of leaf-beetles, No.56
2 beetle heads, sp ?
4 beetle mandibles, No.85
1 cricket mandible, sp?
5 grasshopper mandibles, sp?
1.4 cc. ground up insects, mostly beetles, sp?
5 seeds of two-leaved Solomon's seal, No. 38
3.5 cc. conglomerate vegetation

108 stones = 2.8 cc.

BIRD NO.114 - Male - Adult - from north central Hughes County. Shot July 2, 1929, at 8:30 P.M., on prairie. Surrounding fields: corn and flax. Last year they were in wheat which was badly hailed when nearly ripe.

Crop Contents

1 beetle, No. 85
349 kernels of wheat
9.2 cc. wheat chaff

Gizzard Contents

1 beetle, No. 85
0.8 cc. ground up beetles and grasshoppers, sp?
57 kernels of wheat
25 seeds of sedge, No. 35
6.5 cc. corglomerate vegetation

256 stones = 2.8 cc.

BIRD NO.115 - Male - Adult - from north central Hughes County. Shot July 2, 1929, at 8:45 P.M., on prairie. Fields of corn and wheat nearby. Wheat last year was badly hailed when ripening.

Crop Contents

1 beetle grub, No. 60
7 caterpillars
3 - No. 183
1 - No. 177
2 - No. 182
1 - No. 179
3 grasshopper nymphs, sp?
10 sawfly grubs, No. 160
2 stink bugs, No. 134
4 spiders, No. 188

243 kernels of barley
0.5 cc. barley chaff
4 kernels of wheat
4 composite blossoms, sp?

Gizzard Contents

1 ant head, sp?
1 beetle head, No. 17
3 beetle mandibles, No.19
7 caterpillar mandibles, sp?
1 grasshopper, No. 107
6 grasshopper mandibles, sp?
1 stink bug head, No. 135
0.6 cc. ground up bugs and beetles, sp?

70 kernels of barley
1 seed wild buckwheat, No. 42
1 seed narrow-leaved puccoon, No. 93
21.75 cc. conglomerate vegetation

179 stones = 3.5 cc.

BIRD NO.116 - Male - Adult - fron north central Hughes County. Shot July 7, 1929, at 6:15 P.M., on rough prairie land along Missouri River. Small field of corn nearby, also timber land, brush and wild fruit.

Crop Contents

1 caterpillar, No. 179
6 grasshoppers
4 - No.100: 1 - No.106
1 - No.107
1 katydid, No. 115

13 fruits of golden currant, containing 247 seeds, No. 59
0.1 cc. conglomerate vegetation

Gizzard Contents

1 ant head, sp?
1 beetle head, No. 85
2 beetle mandibles, sp?
41 grasshopper mandibles, sp?
6 cc. ground up grasshoppers, sp?

1545 golden currant seeds, No. 59
4 unidentified seeds
2.2 cc. conglomerate vegetation

53 stones = 1.4 cc.

BIRD NO.117 - Male - Adult - from south central Potter County. Shot July 18, 1929, at 8:00 P.M., on a road which was bordered by prairie on one side and barley, 18 inches high, on the other. The barley field was in wheat last year.

Crop Contents

1 caterpillar, No. 182	113 kernels of barley 24 kernels of oats 2 kernels of wheat 2 seeds narrow-leaved puccoon No. 93 3 seeds wild buckwheat, No.42 3.1 cc.conglomerate vegetation

Gizzard Contents

3 beetle mandibles 2 - No. 17 1 - No. 31 4 cricket mandibles,sp? 2 cutworm mandibles,sp? 2 grasshopper mandibles,sp? 0.25 cc. ground up crickets & grasshoppers sp?	7 kernels of barley 6 kernels of oats 3 fragments of kernels of wheat 106 seeds of sedge, No. 35 12 seeds two-leaved Solomon's seal, No. 38 59 seeds wild buckwheat,No.42 21.5 cc.conglomerate vegetation

450 stones = 3.7 cc.

BIRD NO.118 - Female - Young - from northeastern Hughes County. Killed July 27, 1929, at about 11:00 A.M. Killed by car on highway. Surrounding fields were of wheat, corn and pasture land.

Crop Contents

1 ant-like flower beetle,No.1 2 click-beetles,No.62 1 darkling beetle, No.85 1 ground beetle, No. 5 Few bits of beetle, sp? 1 grasshopper, No. 102	67 kernels of wheat 173 seeds green foxtail, No.27 3.3 cc.conglomerate vegetation

Gizzard Contents

1 ant mandible, sp? 4 heads & 6 mandibles of darkling beetles,No.85 1 head & 8 mandibles of ground beetle, No.17 4 cricket mandibles, sp? 8 heads & 45 mandibles of grasshoppers, sp? 3 cc. ground up grasshoppers and beetles, sp?	20 kernels of wheat 9 seeds barnyard grass, No.16 723 seeds green foxtail, No.27 1 seed sweet clover, No.74 7.3 cc.conglomerate vegetation

74 stones = 1.8 cc.

BIRD NO.119 - Male - Adult - from Hughes County. Shot August 6, 1929, at 5:30 P.M., along highway. Fields of barley, corn and wheat on sides of highway. Corn land in wheat the year before.

Crop Contents

1 grasshopper, No. 103
5 kernels of wheat
1 seed green foxtail, No.27

Gizzard Contents

6 ant mandibles, sp?
20 beetle mandibles
12 - No. 17
6 - No. 85
1 - No. 86
1 - sp?
1 grasshopper, No. 98
59 grasshopper mandibles, sp?
3.3 cc. ground up beetles and grasshoppers, sp?
2 kernels of barley
60 kernels of wheat
514 seeds green foxtail, No.27
4 seeds wild buckwheat, No.42
14.2 cc.conglomerate vegetation
2 galls, No. 118

283 stones = 3.6 cc.

BIRD NO. 120 - Female - Young - from north central Sully County. Shot August 28, 1929, at 6:00 P.M., in wheat stubble near highway. Corn field across the road.

Crop Contents

1 grasshopper, No. 106

Gizzard Contents

1 beetle mandible, sp?
34 cricket mandibles, sp?
1 head & 24 mandibles of grasshoppers, sp?
3 cc. ground up crickets and grasshoppers, sp?
5 kernels of barley
2 seeds barnyard grass, No.16
36 seeds green foxtail, No.27
25 seeds yellow foxtail, No.25
2 seeds narrow-leaved puccoon, No. 93
3 seeds two-leaved Solomon's seal, No. 38
4 seeds Dakota vetch, No.70
3.2 cc.conglomerate vegetation

20 stones = 5 cc.

BIRD NO.121 - Male - Young - from north central Sully County. Shot August 28, 1929, at 6:30 P.M., in wheat stubble. Corn field across the road.

Crop Contents

3 field crickets, No.110
hind leg of grasshopper, sp?
23 kernels of wheat
1 small stone

Gizzard Contents

3 ant heads, sp?
3 beetle mandibles, No.17
58 cricket mandibles, sp?
1 grasshopper, No.101
2 heads & 36 mandibles of grasshoppers, sp?
8.6 cc. ground up crickets and grasshoppers, sp?
15 kernels of wheat
1 seed needle grass, No.30
5 seeds of sedge, No.35
7.6 cc. conglomerate vegetation

31 stones = 1.2 cc.

BIRD NO.122 - Female (?) - Young - from central Sully County. Shot August 28, 1929, at about 7:30 P.M., on wheat stubble. Recently cut corn adjoining the stubble. Shot by game law violator.

Crop Contents

11 ants(5 queens), No.150
1 head & thorax of ant, sp?
1 braconid, No. 143
1 field cricket, No. 110
5 grasshoppers. 3- No.109
1 - No.102. 1 - No.103
3 snails, No. 190
2 spiders, No. 188
1 stink-bug nymph, No.135
1 tree cricket, No.112
0.17 cc. broken up tree crickets & spiders, sp?
152 kernels of wheat
1 seed barnyard grass, No.16
3 seeds narrow-leaved puccoon, No. 93
1 seed sweet clover, No.74
0.3 cc. conglomerate vegetation

Gizzard Contents

2 ant heads, sp?
8 heads, 50 mandibles of grasshoppers, sp?
10.5 cc. ground up grasshoppers, sp?
7 kernels of wheat
1 seed green foxtail, No.27
19 seeds narrow-leaved puccoon, No. 93
1 seed Dakota vetch, No.70
2 seeds wild buckwheat, No.42
4.9 cc. conglomerate vegetation

10 stones = 0.1 cc.

BIRD NO.123 - Sex unknown - Young - from central Sully County. Shot August 28, 1929, about 7:30 P.M., on wheat stubble recently cut. Corn on two sides, farmyard on other. Shot by game law violator.

Crop Contents

4 queen ants, No.150	1 kernel of corn
9 beetles: 5 - No.16	1 kernel of oats
1 - No.17: 1 - No. 5	124 kernels of wheat
1 - No.35: 1 - No.53	69 seeds green foxtail, No.27
1 beetle grub, No. 17	1 seed knotweed, No.46
10 field crickets, No.110	1 seed Dakota vetch, No.70
1 caterpillar No. 183	0.4 cc.conglomerate vegetation
1 snipe-fly, No. 171	
2 grasshoppers, No.103	
1 adult moth, sp?	

1 stone

Gizzard Contents

4 ant heads, sp?	1 kernel of barley
2 heads snout beetles, sp?	49 kernels of wheat
3 beetle mandibles, No.17	14 seeds barnyard grass, No.16
5 heads and 34 mandibles of crickets, sp?	71 seeds green foxtail, No.27
	38 seeds yellow foxtail, No.25
2 fly heads, sp?	1 seed knotweed, No. 46
2 heads and 16 mandibles of grasshoppers, sp?	4 seeds old-witch grass, No.19
	18 seeds Dakota vetch, No. 70
7.3 cc. broken up crickets and grasshoppers, mostly crickets, sp?	8 seeds wild buckwheat, No.42
	9 seeds wild sunflower, No.114
	6.4 cc.conglomerate vegetation

55 stones = 1.5 cc.

BIRD NO.124 - Sex unknown - Young - from central Sully County. Shot August 28, 1929, about 7:30 P.M., on wheat stubble recently cut. Corn on two sides, farmyard on one side. Shot by game law violator.

Crop Contents

1 ant-like flower beetle, No.2	1 kernel of corn
5 field crickets, No.110	223 kernels of wheat
1 robber fly, No.162	17 seeds green foxtail, No.27
3 grasshoppers	4 seeds yellow foxtail, No.25
1 - No.102: 2 -No.103	1 seed Russian thistle, No.50
2 spiders, No. 188	0.38 cc.conglomerate vegetation

Gizzard Contents

6 ant heads, sp?	30 kernels of wheat
2 beetle mandibles, No.17	3 seeds barnyard grass, No.16
4 field crickets, No. 110	78 seeds green foxtail, No.27
6 cricket mandibles, sp?	27 seeds yellow foxtail, No.25
2 heads & 29 mandibles of grasshoppers, sp?	10 seeds Dakota vetch, No.70
	8 seeds wild buckwheat, No.42
10 cc.ground up crickets & grasshoppers, sp?	1 seed wild sunflower, No.114
	10 cc.conglomerate vegetation

88 stones = 1.5 cc.

BIRD NO.125 - Male-Young - from east central Sully County. Shot August 31, 1929, at 10:30 A.M., on open prairie: no farm land in sight.

Crop Contents

None

Gizzard Contents

5 beetle mandibles
3 - No.19: 2 - No.86
16 grasshopper mandibles, sp?
0.57 cc. broken up beetles and grasshoppers, mostly beetles, sp?
9 seeds sweet clover, No.74
7 seeds wild rose, No.66
73 seeds wild sunflower, No.114
7.5 cc. conglomerate vegetation

98 stones = 2.6 cc.

BIRD NO.126 - Female - Young - from west central Hand County. Killed by automobile September 11, 1929, at 7:00 P.M., on highway east of Ree Heights. Corn fields on both sides of highway.

Crop Contents

1 ant-like flower beetle, No. 1
1 field cricket, No.110
1 caterpillar, No. 183
5 grasshoppers
3 - No. 103 · 2 - No.109
27 kernels of corn
288 seeds green foxtail, No.27
1 seed wild sunflower, No.114
04 cc. corglomerate vegetation

Gizzard Contents

1 head of snout beetle, No. 89
3 beetle mandibles, No.17
54 cricket mandibles, sp?
3 heads and 68 mandibles of grasshoppers, sp?
6 cc. broken up grasshoppers, sp?
2 kernels corn & 9 fragments
1 kernel of wheat
2 seeds feather-grass, No.31
346 seeds green foxtail, No.27
6 seeds yellow foxtail, No.25
3 seeds of psoralea, No.75
1 seed wild buckwheat, No.42
13 seeds wild sunflower, No.114
11 cc. conglomerate vegetation

335 stones = 3.1 cc.

BIRD NO.127 - Male - Young - from west central Hand County. Killed by automobile September 11, 1929, at 7:00 P.M., on highway east of Ree Heights. Corn fields on both sides of highway.

Crop Contents

7 field crickets, No. 110	36 kernels of corn & 6 fragments
1 head and thorax of field cricket, No.110	9 kernels of barley
13 grasshoppers	3 kernels of oats
5 - No.102: 4 - No.103	7 kernels of wheat
2 - No.104: 2-No.106	1 alfalfa seed pod containing 2 seeds
1 grasshopper mandible, sp?	1 seed green foxtail, No.27
1 millipede, No. 189	2 seeds sweet clover, No.74
1 adult moth, sp?	0.25 cc.conglomerate vegetation
5 snails, No.190	
1 tree cricket, No.112	

Gizzard Contents

22 beetle mandibles	5 seeds of alfalfa
21 - No.13: 1 - No.86	1 seed of knotweed, No. 46
1 bug head, sp?	2 unidentified seeds
7 heads and 35 mandibles of crickets, No.110	11.6 cc.conglomerate vegetation
4 heads & 74 mandibles of grasshoppers, sp?	
8 cc. ground up crickets and grasshoppers, sp?	

232 stones = 3.3 cc.

BIRD NO.128 - Female - Young - from east central Hand County. Shot September 13, 1929, at 10:00 A.M. Corn fields on three sides: oats on the other.

Crop Contents

1 beetle, No. 15	1 kernel of wheat

Gizzard Contents

1 beetle head, sp?	13 kernels of wheat
9 beetle mandibles,	14 seeds wild buckwheat, No.42
8 - No. 17	2.4 cc.conglomerate vegetation
1 - sp?	
1 head and 4 mandibles of grasshoppers, sp?	
1.3 cc. broken up insects, mostly grasshoppers, sp?	

63 stones = 1.9 cc.

BIRD NO.129 - Female - Young - from north central Sully County. Killed by hawk September 18, 1929, about 11:00 A.M. Corn field and oats stubble nearby.

Crop Contents

2 grasshoppers, No.102	27 kernels corn & 40 fragments 31 seeds green foxtail, No. 27 7 seeds yellow foxtail, No.25 156 seeds wild sunflower, No.114 2.5 cc.conglomerate vegetation

Gizzard Contents

3 cricket mandibles, sp? 53 grasshopper mandibles, sp? 3 cc. ground up grasshoppers, sp?	11 kernels corn & 20 fragments 20 seeds green foxtail, No.27 30 seeds yellow foxtail, No.25 5 seeds of sedge, No. 35 25 seeds two-leaved Solomon's seal, No. 38 1 seed Dakota vetch, No. 70 102 seeds wild buckwheat, No.42 162 seeds wild sunflower, No.114 7.5 cc.conglomerate vegetation

48 stones = 0.8 cc.

BIRD NO.130 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 9:30 A.M. in lake bed. Surrounding areas: wheat stubble (not planted the past year) and corn.

Crop Contents

77 kernels of corn 39 kernels of barley 0.7 cc. barley hulls 5 kernels of wheat 40 seeds green foxtail, No. 27 1 seed of psoralea, No. 75 7 seeds wild sunflower, No.114

Gizzard Contents

2 cricket mandibles, sp? 6 grasshopper mandibles, sp? 0.17 cc. ground up grasshoppers, sp?	22 fragments of kernels of corn 4 kernels of barley 1 kernel of wheat 1 seed barnyard grass, No.16 61 seeds green foxtail, No.27 24 seeds knotweed or marsh smartweed, No. 43 37 seeds of Dakota vetch, No.70 3 seeds wild rose, No. 66 1 seed of wood sage, No. 96 10.1 cc.conglomerate vegetation

191 stones = 2.5 cc.

BIRD NO.131 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 9:30 A.M., in lake bed. Surrounding areas: wheat stubble (not planted the past year) and corn.

Crop Contents

1 grasshopper, No. 102	1 kernel of corn
1 katydid, No. 113	945 seeds green foxtail, No.27
1 spider, No. 188	2.5 cc. green foxtail bristles, No. 27
	83 seeds proso millet, No. 20
	1 seed Dakota vetch, No. 70
	6 seeds wild sunflower, No.114

Gizzard Contents

1 beetle mandible,sp?	3 seeds of bindweed, No. 90
2 cricket mandibles, sp?	193 seeds green foxtail, No.27
9 grasshopper mandibles, sp?	1 seed of knotweed or marsh smartweed, No. 43
1.5 cc. broken up crickets and grasshoppers, mostly grasshoppers, sp?	1 seed lamb's quarters, No.49
	24 seeds proso millet, No. 20
	2 seeds wild rose, No. 66
	4 seeds wild sunflower, No.114
	7 cc.conglomerate vegetation some proso millet hulls

133 stones = 2.3 cc.

BIRD NO.132 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 9:30 A.M., in lake bed. Surrounding areas: wheat stubble (not planted the past year) and corn.

Crop Contents

3 grasshoppers	20 kernels of corn
2 - No. 102	2 kernels of emmer
1 - No. 103	15 seeds green foxtail, No.27
1 moth wing, sp?	11 seeds knotweed or marsh smartweed, No. 43
	41 seeds wild sunflower, No.114
	0.17 cc. grass leaves

Gizzard Contents

1 head of snout beetle, No. 89	10 kernels of corn & 13 fragments
4 beetle mandibles, sp?	19 seeds green foxtail, No. 27
1 grasshopper, No. 98	1 seed of gaura, No. 87
22 grasshopper mandibles, sp?	3 seeds of knotweed, No. 46
1.5 cc. ground up insects, mostly grasshoppers,sp?	16 seeds of knotweed or marsh smartweed, No. 43
	1 seed sweet clover, No. 74
	7 seeds wild buckwheat, No.42
	26 seeds wild rose, No. 66
	19 seeds wild sunflower, No.114
	9.2 cc.conglomerate vegetation

65 stones = 1.2 cc.

BIRD NO.133 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 4:30 P.M. on wheat stubble which was a year old: corn adjoining the stubble.

Crop Contents

	11 seeds wild sunflower, No.114

Gizzard Contents

5 cricket mandibles, sp? 1 head and 18 mandibles of grasshopper, sp? 2 cc.broken up grasshoppers, sp?	16 kernels of barley 1 seed green foxtail, No.27 1 seed yellow foxtail,No.25 1 seed knotweed, No. 46 13 seeds little ragweed,No.107 52 seeds sweet clover, No.74 2 seeds wild buckwheat,No.42 106 seeds wild sunflower,No.114 7.3 cc.conglomerate vegetation

197 stones = 3.2 cc.

BIRD NO.134 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 4:30 P.M., on wheat stubble which was a year old. Corn adjoining the stubble.

Crop Contents

	2 kernels of barley 1 seed lamb's quarters,No.49 22 seeds wild sunflower,No.114

Gizzard Contents

1 chalcid fly, No. 144 29 grasshopper mandibles, sp? 2.5 cc. ground up grasshoppers, sp?	14 kernels of barley 7 seeds green foxtail,No.27 7 seeds knotweed, No. 46 2 seeds little ragweed,No.107 8 seeds sweet clover, No. 74 24 seeds Dakota vetch, No. 70 20 seeds wild buckwheat,No.42 8 seeds wild rose, No.66 125 seeds wild sunflower,No.114 11.1 cc. conglomerate vegetation

235 stones = 2.7 cc.

BIRD NO. 135 - Male - Young - from north central Faulk County. Shot by game law violator October 6, 1929, at 4:30 P.M., on wheat stubble which was a year old. Corn adjoining the stubble.

Crop Contents

	5 seeds wild sunflower, No.114
	1 grass leaf, sp?

Gizzard Contents

1 beetle mandible, sp?	1 kernel of wheat
1 cricket head, sp?	11 seeds knotweed, No. 46
16 grasshopper mandibles, sp?	3 seeds little ragweed, No.107
0.5 cc. ground up beetles and grasshoppers, sp?	4 seeds sweet clover, No. 74
	3 seeds Dakota vetch, No. 70
	19 seeds wild rose, No. 66
	21 seeds wild sunflower, No.114
	11.2 cc. conglomerate vegetation

190 stones = 2.9 cc.

BIRD NO.136 - Female - Adult - from northeastern Hughes County. Shot November 11, 1929, at 4:00 P.M., in a hailed wheat stubble, surrounded by corn and pasture land.

Crop Contents

1 Thorax of beetle, sp?	253 kernels of wheat
1 spider, No. 188	6 cc. wheat chaff
	3 seeds green foxtail, No.27
	1 seed lamb's quarters, No.49
	2 seeds Russian thistle, No.50
	17 seeds wild buckwheat, No. 42
	2 seeds wild sunflower, No.114

Gizzard Contents

6 grasshopper mandibles. sp?	15 kernels of wheat
0.13 cc. ground up grasshoppers, sp?	7 seeds green foxtail, No. 27
	14 seeds of knotweed, No. 46
	2 seeds Russian thistle, No.50
	3 seeds of vetch. No. 77
	77 seeds wild buckwheat, No. 42
	1 seed wild sunflower, No. 114
	12.7 cc. conglomerate vegetation

519 stones = 3.cc.

BIRD NO.137 - Female - Adult - from northeastern Hughes County. Shot November 12, 1929, at 11:00 A.M., in a Russian thistle patch surrounded by corn, wheat stubble and pasture.

Crop Contents

167 seeds of flax & 7 seed pods containing 189 seeds
2 cc. flax chaff
3 seeds proso millet, No.20
508 seeds wild buckwheat, No.42
4 unidentified seeds

Gizzard Contents

1 cricket mandible, sp?
1 bit of grasshopper leg, sp?

22 seeds of flax
177 seeds wild buckwheat, No.42
6.3 cc. conglomerate vegetation including some hulls of wild buckwheat

353 stones = 3.8 cc.

BIRD NO.138 - Male-Adult - from northeastern Sully County. Shot January 21, 1930, at 4:30 P.M., in hogged-down corn, surrounded by fields of alfalfa and corn.

Crop Contents

None

Gizzard Contents

1 seed wild rose, No. 66
2.3 cc. conglomerate vegetation

555 stones = 4 cc.

BIRD NO.139 - Male - Adult - from northeastern Sully County. Killed by flying against fence wire, January 21, 1930, near hogged-down corn, adjoining fields of alfalfa and wheat stubble.

Crop Contents

1 bit of vegetation

Gizzard Contents

2 kernels of corn
2 seeds two-leaved Solomon's seal, No. 38
2 seeds wild rose, No. 66
11 cc. conglomerate vegetation

413 stones = 5.3 cc.

BIRD NO.140 - Male - Adult - from southwestern Haakon County. Shot January 29, 1930, at 3:00 P.M., on pasture land in a creek valley, surrounded by fields of barley, corn, millet and alfalfa.

Crop Contents

2 grasshoppers	583 kernels of barley
1 - No. 91	4 cc. barley chaff
1 - No. 95	1 kernel of oats
2 small bits of insect, sp?	2 kernels of wheat
	1 seed of vetch, No. 77
	1 seed of wild oats, No. 8

6 stones = 0.25 cc.

Gizzard Contents

2 cricket mandibles, sp?	29 kernels of barley
10 grasshopper mandibles, sp?	1 seed of psoralea, No.75
0.5 cc. ground up crickets and grasshoppers, sp?	3 seeds of vetch, No. 77
	2 seeds wild rose, No. 66
	3 seeds wolfberry, No.104
	15.2 cc.conglomerate vegetation

330 stones = 4.8 cc.

BIRD NO.141 - Male - Adult - from Stanley County. Shot February 25, 1930, at 3:30 P.M., on highway No. 11, between Ft. Pierre and Missouri River bridge. Woods, brush, berry patches and sloughs nearby.

Crop Contents

329 seeds barnyard grass, No.16
1 seed prickly lettuce, No.116
348 seeds Russian thistle, No.50
31 seeds wolfberry, and 800 fruits containing 1600 seeds, No. 104
0.6 cc.conglomerate vegetation

5 stones = 0.1 cc.

No gizzard sent in

BIRD NO.151 - Male - Adult - from Day County. Shot April 4, 1929, at 3:30 P.M., in plowed field: cut corn, hay and plowed field adjoining.

Crop Contents

	4 kernels of barley
	5 kernels of oats
	50 kernels of wheat
	2 seeds wild oats, No. 8
	1 cc.foxtail and wheat chaff

48 stones (very small)

Gizzard Contents

42 beetle mandibles,sp?	116 kernels of wheat
0.2 cc. ground up beetles, sp?	2 seeds of bindweed, No.90
	131 seeds green foxtail, No.27
	37 seeds yellow foxtail,No.25
	1 seed lamb's quarters,No.49
	1 seed rough pigweed, No.52
	7 seeds wild buckwheat,No.42
	2 unidentified seeds
	.9 cc.conglomerate vegetation

577 stones = 2.9 cc.

BIRD NO.152 - Male - Adult - from east central Day County. Shot April 14, 1929, at 4:15 P.M., in a rocky pasture. Adjoining fields were of corn, wheat and hay. Slough and lake nearby.

Crop Contents

4 beetles, No. 17	7 kernels of corn
9 March fly larvae,No.165	4 kernels of barley
	116 kernels of wheat
	2.5 cc. wheat chaff
	2 seeds rough pigweed, No.52

Gizzard Contents

	36 kernels of wheat
3 beetles, No. 17	10.5 cc. wheat bran
1 beetle & 2 heads,No.63	1 seed barnyard grass, No.16
1.1 cc. ground up beetles, sp?	1 seed green foxtail, No.27
	38 seeds yellow foxtail,No.25
1 millipede, No. 189	2 seeds rough pigweed, No.52
	5 seeds wild buckwheat,No.42
	21 seeds wild rose, No.66
	1 unidentified seed

380 stones = 2.8 cc.

BIRD NO.153 - Female - Young - from east central Day County. Shot April 24, 1929, at 5:00 P.M., on plowed field, adjoining corn, wheat and hay. Bird had left cut corn and gone to plowed field.

Crop Contents

10 beetles	21 kernels of rye
1 - No. 22	1 seed green foxtail, No. 27
9 - No. 17	3 seeds yellow foxtail, No.25
2 millipedes, No. 189	2 cc. leaves, sp?

Gizzard Contents

1 beetle, No. 17	15 kernels of wheat
4 beetle heads	7 seeds green foxtail, No. 27
1 - No. 17	16 seeds yellow foxtail, No. 25
3 - sp?	3 seeds wild buckwheat, No. 42
203 beetle mandibles, No.13	1.2 cc. conglomerate vegetation
3.2 cc. ground up insects, sp?	

745 stones = 3.2 cc.

BIRD NO.154 - Female - Young - from northwestern Grant County. Shot May 9, 1929, at 4:10 P.M. Had been feeding in wheat field in which the grain was just coming up. Newly planted corn field nearby.

Crop Contents

	25 kernels of oats
	0.08 cc. oat hulls

Gizzard Contents

2 beetle mandibles	2 kernels of oats
1 - No.17: 1 - sp?	16 cc. oat hulls
0.2 cc. ground up beetles, sp?	1 seed wild rose, No. 66

435 stones = 4 cc.

BIRD NO.201 - Female - Adult - from south central Brown County. Shot April 3, 1929, at 5:00 P.M., in wheat stubble (no grain planted), surrounded by fields of sweet clover, corn and alfalfa.

Crop Contents

	27 kernels of wheat
	5 seeds green foxtail, No.27
	1 seed of millet
	0.4 cc. conglomerate vegetation

Gizzard Contents

0.02 cc. beetle parts, sp?	34 kernels of wheat
	4 seeds of catnip, No. 95
	8 seeds green foxtail, No. 27
	3 seeds yellow foxtail, No. 25
	53 seeds of millet
	3 seeds Dakota vetch, No. 70
	11 seeds wild buckwheat, No.42
	9 seeds wild rose, No.66
	55 unidentified seeds
	12.5 cc. conglomerate vegetation

254 stones = 2.7 cc.

BIRD NO.202 - Female - Adult - from south central Brown County. Shot April 11, 1929, at 2:30 P.M., in wheat stubble (wheat being sown again), surrounded by fields of sweet clover, corn and alfalfa.

Crop Contents

4 snout beetles, No.89	1 kernel of oats
48 beetles	35 kernels of wheat
43 - No.17: 1 - No.10	2 seeds green foxtail, No.27
1 - No.74: 1 - No.22	1 seed little ragweed, No.107
1 - No.21: 1 - No.35	1 seed wild buckwheat, No.42
1 click-beetle, No. 66	1 cc.conglomerate vegetation
1 ground beetle, No.13	
1 chinch-bug, No. 124	
6 field crickets, No.110	
3 cutworms, sp?	
69 March-fly larvae, No.165	
2 spiders & 5 legs, No.188	

12 stones = 0.5 cc.

Gizzard Contents

2 snout beetles, No.89	1 seed green foxtail, No. 27
1 beetle head, No. 21	4 seeds Dakota vetch, No. 70
7.4 cc.ground up beetles, mostly No. 17	1 seed wild buckwheat, No. 42
	3 seeds wild rose, No. 66
1 cricket leg, No. 110	0.04 cc.conglomerate vegetation
1 old grasshopper, No.103	
1 old millipede, No. 189	

149 stones = 2.9 cc.

BIRD NO.203 - Male - Adult - from central Brown County. Shot April 23, 1929, at 4:00 P.M., in wheat stubble (wheat being sown again), surrounded by fields of sweet clover, corn and alfalfa.

Crop Contents

2 beetle mandibles, No. 13	21 kernels of corn
0.04 cc.ground up beetles, No. 13	4 seeds of oats
	50 kernels of wheat
	1 seed Russian thistle, No.50
	0.17 cc.conglomerate vegetation

10 very small stones

Gizzard Contents

	43 kernels of wheat
	4 buffalo grass spikelets, No.12
	1 seed of millet
	2 seeds rough pigweed, No. 52
	13 seeds wild rose, No. 56
	2 unidentified seeds

311 stones = 4.4 cc.

BIRD NO.204 - Male - Adult - from south central Brown County. Shot May 4, 1929, at 1:00 P.M., in area where wheat, oats, and barley were seeded.

Crop Contents

4 beetles, No. 17	380 kernels of wheat
1 beetle, No. 77	4 seeds yellow foxtail, No.25
	4 seeds millet, No. 26
	3 cc.conglomerate vegetation

Gizzard Contents

8 beetles, No. 17	26 kernels of wheat
0.5 cc. broken up insects, mostly No.17	1 seed barnyard grass, No.16
	5 seeds green foxtail, No.27
	42 seeds yellow foxtail, No.25
	1 seed of millet, No. 26
	1 seed Russian thistle, No.50
	1 unidentified seed
	19 cc. wheat (?) bran

320 stones = 3.4 cc.

BIRD NO.205 - Male - Adult - from south central Brown County. Shot May 11, 1929, at 4:00 P.M., in area where wheat and oats were seeded. Fields of sweet clover and alfalfa nearby.

Crop Contents

6 March-flies, No. 165	2 kernels of wheat
	0.5 cc.alfalfa (?)leaves

Gizzard Contents

1 head and thorax of beetle, No. 35	1 seed of bindweed, No. 90
6 March-flies, No.165	1 seed Dakota vetch, No.70
0.33 cc.ground up insects, mostly March-flies,No.165	2 seeds wild buckwheat,No.42
	1 seed wild rose, No. 66
	4 cc. grass leaves

255 stones = 3.9 cc.

BIRD NO.206 - Male - Adult - from southeastern Brown County. Shot May 18, 1929, at 5:00 P.M., in area where wheat, oats and barley were seeded nearby.

Crop Contents

1 beetle, No. 17	276 kernels wheat (some germinated)
	1 seed Dakota vetch, No. 70
	0.07 cc.conglomerate vegetation

Gizzard Contents

0.25 cc. ground up insects, mostly old grasshoppers, sp?	15 kernels of barley
	1 kernel of oats
	20 kernels of wheat
	8 seeds yellow foxtail, No.25
0.25 cc.pheasant egg shell	2.5 cc.conglomerate vegetation

300 stones = 3.9 cc.

BIRD NO.207 - Male - Adult - from south central Brown County. Shot May 27, 1929, at 4:00 P.M., in area where wheat, corn and barley were planted nearby.

Crop Contents

5 beetles: 1 - No. 17
1 - No. 76: 3 - No.77
1 click beetle, No. 62
1 water scavenger beetle, No. 70
394 Borborid flies, No.167
5 kernels of oats
1 kernel of wheat
1 seed green foxtail, No. 27
1.6 cc. conglomerate vegetation

Gizzard Contents

38 heads & 2 mandibles of ants, sp?
8 beetle heads: 2 - No.13
1 - sp? 5 - No. 17
97 beetle mandibles
96 - No.17: 1 - No.13
7 cc. ground up beetles, numbers 17 and 78
1 grasshopper mandible, sp?
5 cc. oat hulls
40 kernels of wheat
5 seeds green foxtail, No. 27
6 seeds yellow foxtail, No. 25
1 seed wild buckwheat, No. 42
1 seed wild rose, No. 66

111 stones = 1.5 cc

BIRD NO.208 - Female - Adult - from south central Brown County. Shot June 4, 1929, at 5:00 P.M., in wheat stubble adjoining barley stubble. Hailed out last year. Corn nearby.

Crop Contents

3 ants, No. 150
43 beetles: 5 - No. 77
22 - No.74: 14 - No.8
1 - No.56: 1 - No.17
2 beetle abdomens, No.78
1 beetle grub, No. 37
2 beetle grubs, No. 38
43 March-flies, No. 165
1 spider, No. 188
1 fragment of kernel of corn
2 seeds green foxtail, No. 27
1 cc. conglomerate vegetation

Gizzard Contents

7 ant heads, sp?
1 bee head, sp ?
2 beetles, No. 86
5 beetle heads, No. 78
5 beetle heads, sp?
14 beetle mandibles: 9 - No.17
1 - No. 13: 2 - No. 31
1 - No. 86: 1 - sp?
1 cricket mandible, sp?
8.1 cc. ground up beetles & one Hymenopteron, sp?
23 seeds green foxtail, No. 27
37 seeds yellow foxtail, No. 25
1 seed narrow-leaved puccoon, No. 93
1 seed little ragweed, No.107
3 seeds wild buckwheat, No.42
4 cc. conglomerate vegetation

246 stones = 2.1 cc.

BIRD NO.209 - Male - Adult - from central Brown County. Shot June 10, 1929, at 4:30 P.M., in wheat stubble. Surrounding fields of corn, sweet clover and alfalfa.

Crop Contents

24 kernels of wheat,3 sprouted

Gizzard Contents

3 heads snout beetles,sp?
8 beetle mandibles
6 - No.17. 2 - No.19
0.43 cc.ground up beetles, sp?
58 kernels of wheat
2 seeds of bindweed, No. 90
4.1 cc.conglomerate vegetation

138 stones - 2.5 cc.

BIRD NO.210 - Male - Adult - from central Brown County. Shot June 15, 1929, at 6:00 P.M., in a field of corn: fields of corn and alfalfa and range land adjoining.

Crop Contents

12 kernels of corn,3 sprouted
0.33 cc.conglomerate vegetation

Gizzard Contents

1 snout beetle, No. 89
4 heads of snout beetles, No. 89
0.57 cc. ground up snout beetles, No. 89
2 beetle heads , sp?
1 beetle mandible, sp?
0.08 cc. ground up beetles, No. 13
4 caterpillar mandibles, sp?
2 kernels of corn
7.4 cc. corn bran
107 seeds two-leaved Solomon's seal, No. 38

421 stones - 3 cc.

BIRD NO.211 - Male - Adult - from north central Spink County. Shot June 25, 1929, at 6:00 P.M., in section where corn, wheat, alfalfa and oats were being grown.

Crop Contents

6 beetles
2 - No. 43
1 - No. 17
3 - No. 45
1 click beetle, No. 62
14 cutworms, sp?
1 fly, No. 169
1 kernel of barley
7 kernels of oats
9 kernels of wheat
1 seed barnyard grass, No.16
85 seeds cultivated buckwheat
92 seeds yellow foxtail, No.25
13 seeds millet, 1 sprouted, No.26
1 seed sweet clover, No. 74
4 seeds Dakota vetch, No.70
27 seeds wild buckwheat, No.42
2 seeds wild sunflower, No.114

Gizzard Contents

1 head snout beetle, No.89
2 beetles
1 - No. 86: 1 - No. 6
1 beetle head, sp?
2 beetle heads, No. 42
2 heads & 4 mandibles of beetles, No. 17
2 beetle mandibles, No. 31
21 cutworms, sp?
7 heads & 40 mandibles of cutworms, sp?
1 fly puparium, sp?
1 grasshopper nymph, No.107
11 spiders, No. 188
1.5 cc. ground up insects, sp?
1 seed of alfalfa
2 blue grass spikelets, No.23
2 seeds cultivated buckwheat
108 seeds yellow foxtail, No.25
37 seeds of millet, No. 26
1 seed little ragweed, No.107
1 seed sweet clover, No. 74
17 seeds Dakota vetch, No.70
70 seeds wild buckwheat, No.42
1 seed wild rose, No. 66
30 unidentified seeds
7.5 cc. conglomerate vegetation

169 stones = 2 cc.

BIRD NO. 212 - Lost in the mail

BIRD NO. 213 - Male - Adult - from Spink County. Shot July 22, 1929, at 6:30 P.M., in corn field surrounded by fields of corn, wheat, oats and barley.

Crop Contents

None

Gizzard Contents

1 ant head, sp?
24 beetle mandibles
22 - No. 17: 2 - No.13
0.43 cc. ground up beetles
4 cutworm mandibles, sp?
4 grasshopper mandibles, sp?
1 kernel of barley
6.2 cc. conglomerate vegetation

592 stones = 3.3 cc.

BIRD NO.214 - Male - Adult - from northeastern McPherson County. Shot October 4, 1929, at 6:00 P.M., in corn field surrounded by fields of wheat, oats and sweet clover.

Crop Contents

1 cricket, No. 111	1 seed green foxtail, No. 27
1 field cricket, No. 110	124 seeds pink cleome, No. 57
6 katydids, No. 113	0.6 cc. conglomerate vegetation
5 grasshoppers 3 - No.101; 2 - No.109	

Gizzard Contents

3 beetle mandibles, sp?	20 seeds bur-reed, No. 2
1 portion of beetle, No.38	117 seeds clammy weed, No.58
12 cricket mandibles, sp?	26 seeds green foxtail, No.27
7 heads & 52 mandibles of grasshoppers, sp?	26 seeds of hornwort, No. 54
5.5 cc. ground up crickets & grasshoppers, sp?	1 seed rough pigweed, No. 52
	532 seeds of sedge, No. 35
	10 seeds wild rose, No. 66
	11 cc. conglomerate vegetation

28 stones = 0.8 cc.

BIRD NO.215 - Male - Young - from southwestern Brown County. Shot October 15, 1929, at 3:00 P.M., in corn field adjoining wheat stubble.

Crop Contents

None

Gizzard Contents

2 crickets, No. 110	19 seeds barnyard grass, No. 16
21 cricket mandibles, sp?	2 seeds of knotweed, No. 46
8 grasshopper mandibles, sp?	1 seed wild buckwheat, No. 42
1 head & 1 mandible of Hymenopteron, sp?	4 seeds wild rose, No. 66
	54 seeds wild tomato, No. 100
0.8 cc. ground up beetles and grasshoppers, sp?	3.8 cc. conglomerate vegetation

125 stones = 2.9 cc.

BIRD NO.216 - Male - Adult - from southwestern Day County. Shot October 24, 1929, at 4:00 P.M., in corn field adjoining barley and oat stubble.

Crop Contents

None

Gizzard Contents

1 beetle abdomen, sp?	55 seeds green foxtail, No. 27
1 grasshopper mandible, sp?	43 seeds yellow foxtail, No. 25
	2 seeds of sedge, No. 35
	4.1 cc. conglomerate vegetation

160 stones 1.7 cc.

BIRD NO.217 - Male - Young - from central Brown County. Shot November 9, 1929, at 2:00 P.M., in corn field surrounded by wheat stubble.

Crop Contents

44 kernels of corn
19 seeds green foxtail, No.27
0.2 cc.conglomerate vegetation

Gizzard Contents

2 seeds of bindweed, No. 90
5 seeds of bur-reed, No. 2
22 seeds of pondweed, No. 3
9 seeds of sedge, No. 35
18 seeds of wild rose, No. 66
9 cc.conglomerate vegetation

205 stones = 2.5 cc.

BIRD NO.218 - Male - Young - from central Brown County. Shot November 15, 1929, at 3:00 P.M., in corn field adjoining wheat stubble, sweet clover and alfalfa.

Crop Contents

None

Gizzard Contents

10 kernels of corn
9 cc.mostly corn fragments, some grass leaves, sp?
1 kernel of barley
46 seeds green foxtail, No. 27
27 seeds wild rose, No. 66

149 stones = 2.5 cc.

BIRD NO.219 - Male - Adult - from central Brown County. Shot December 5, 1929, at 4:00 P.M., in corn field surrounded by wheat and oat stubble, corn, sweet clover and alfalfa.

Crop Contents

43 kernels of corn
4 seeds green foxtail, No. 27
0.125 cc.conglomerate vegetation

Gizzard Contents

2 beetle mandibles, No.17
1 grasshopper mandible, sp?

3 kernels corn & 23 fragments
1 seed of bur-reed, No. 2
1 seed ragweed, No.109
1 seed little ragweed, No.107
1 seed of sedge, No. 35
1 seed of smilax, No. 39
1 seed sweet clover, No. 74
1 milk vetch seed pod, No.68
1 seed wild sunflower, No.114
6.1 cc.conglomerate vegetation

250 stones = 2.2 cc.

BIRD NO.220 - Male - Adult - from central Brown County. Shot February 19, 1930, at 4:00 P.M., in wheat stubble, adjoining corn stubble, along James River bottom.

Crop Contents

1 cricket, No. 111	20 kernels of corn
3 grasshoppers	38 kernels of wheat, some sprouted
2 - No. 103	1 seed wild buckwheat, No. 42
1 - No. 106	0.4 cc. conglomerate vegetation

Gizzard Contents

32 grasshopper mandibles, sp?	14 kernels of wheat, some sprouted
0.715 cc. ground up grasshoppers, sp?	5 seeds of knotweed, No. 46
	9 seeds wild buckwheat, No. 42
	4 seeds wild rose
	12.9 cc. conglomerate vegetation

245 stones = 2.5 cc.

BIRD NO.251 - Male - Adult - from northwestern Codington County. Shot April 5, 1929, at 5:45 P.M., in highway ditch near corn field. Plowed fields and prairie adjoining the corn.

Crop Contents

1 ant, No. 146	17 kernels of corn
1 beetle, No. 17	171 kernels of barley
0.5 cc. insect parts, sp?	2 seeds green foxtail, No. 27
	1 cc. wheat chaff

Gizzard Contents

16 beetle mandibles, No. 13	6 kernels of corn
7 grasshopper mandibles, sp?	14 cc. oat hulls
1 head & few segments of millipede, No. 189.	22 kernels of wheat
0.17 cc. broken up insects, sp?	2 seeds wild buckwheat, No. 42
	4 seeds wild rose, No. 66

158 stones = 2.6 cc.

BIRD NO.252 - Male - Adult - from northeastern Grant County. Shot April 17, 1929, at 5:30 P.M., in disked corn field adjoining stubble field of wheat and pasture.

Crop Contents

1 plains wireworm, No. 69	63 kernels of corn
1 beetle leg, No. 13	180 kernels of wheat
	1 seed green foxtail, No. 27
	1 seed of vetch, No. 77
	1 seed wild buckwheat, No. 42
	2.5 cc. conglomerate vegetation

93 stones = 0.02 cc.

(BIRD NO.252 continued on next page)

(BIRD NO.252 - Continued)

Gizzard Contents

19 beetle mandibles, No.13	3 kernels of corn
0.08 cc. ground up beetles, No. 13	1 seed green foxtail, No. 27
	1 seed yellow foxtail, No. 25
	1 seed of vetch, No. 77
	7 seeds wild buckwheat, No. 42
	1 unidentified seed
	16 cc.conglomerate vegetation

308 stones = 3.2 cc.

BIRD NO.253 - Male - Adult - from northwestern Codington County. Shot April 25, 1929, at 4:40 P.M., in edge of a field sown to small grain. Surrounding fields were of natural prairie and small grain.

Crop Contents

7 beetles, No. 17	6 kernels of corn
	932 kernels of barley
	1 seed green foxtail, sprouted, No. 27
	1 seed wild oats, No. 8
	0.33 cc.conglomerate vegetation

0.86 cc. dirt

Gizzard Contents

10 beetle heads, No.13	1 kernel corn & 27 fragments
5 beetle mandibles, No.13	101 kernels of barley
1.5 cc. insect parts, sp?	1 unidentified seed
	11.75 cc. oat hulls

377 stones = 3.8 cc.

BIRD NO.254 - Male - Adult - from southwestern Codington County. Shot May 16, 1929, at 7:00 P. M., near a road with small grain field and pasture adjoining. Grain about 3 inches high.

Crop Contents

1 head of snout beetle, No. 89	1 seed green foxtail, No. 27
	3 seeds yellow foxtail, No.25
	0.4 cc. leaves

Gizzard Contents

27 heads of snout beetles, No. 89	4 seeds green foxtail, No.27
11 beetle mandibles, No.13	2 seeds yellow foxtail, No.25
0.25 cc.ground up beetles, mostly No. 89	4.3 cc.conglomerate vegetation

274 stones = 3.3 cc.

BIRD NO.255 - Male - Adult - from southwestern Codington County. Bird was shot May 18, 1929, at 6:45 P.M., while feeding in small grain field. Grove of trees across the road.

Crop Contents

1 beetle, No. 17	105 kernels of corn
3 cutworms, sp?	2 kernels of barley
1 piece of millipede, No. 189	47 kernels of oats
	1 cc.conglomerate vegetation

Gizzard Contents

18 beetle mandibles, No.17	4 kernels corn & 5 fragments
0.17 cc. ground up beetles, sp?	1 kernel of oats & 4 fragments
1 cutworm, sp?	1 seed wild buckwheat, No. 42
	1 seed wild rose, No. 66

397 stones = 2.7 cc.

BIRD NO.256 - Male - Adult - from south central Codington County. Shot May 25, 1929, at 7:15 P.M., in grass field along road. Small grain and new corn field about 40 rods away.

Crop Contents

	11 kernels of corn & 23 fragments
	203 kernels of rye
	1 unidentified seed
	0.12 cc.conglomerate vegetation

Gizzard Contents

Few bits of beetle, sp?	10 fragments kernels of corn
	2 kernels of barley
	74 kernels of wheat
	7.3 cc.conglomerate vegetation

238 stones 2.5 cc.

BIRD NO.257 - Male - Adult - from east central Deuel County. Shot May 28, 1929, at 4:45 P.M., in a flax field. Prairie land bordered the field and across the road was more flax.

Crop Contents

	1 kernel of oats
	6 seeds green foxtail, No. 27

Gizzard Contents

1 beetle, No. 5	1 seed of flax
32 beetle mandibles	3 kernels of oats
23 - No. 17: 8 - No.19	7 cc. oat hulls
1 - No. 11	12 seeds green foxtail, No.27
0.75 cc. ground up beetles, sp?	1 seed yellow foxtail, No.25
	1 seed of millet, No. 26

622 stones = 2.9 cc.

BIRD NO. 258 - Male - Adult - from northeastern Deuel County. Shot June 4, 1929, at 5:45 P.M., in a small pasture. Grain fields on north and east: corn field, freshly planted, on the south. Across the road was another corn field. Grain up about 4 inches.

Crop Contents

1 seed yellow foxtail, No. 25

Gizzard Contents

3 heads snout beetle, No.89
1 beetle head, sp?
7 beetle mandibles, No.17
0.33 cc. ground up beetles, sp?
2 cutworm mandibles, sp?
2 kernels of barley
1 seed blue-eyed grass, No.40
12 seeds yellow foxtail, No.25
3 seeds smartweed, No. 44
1 seed wild rose, No. 66
4.5 cc. conglomerate vegetation

422 stones = 3.5 cc.

BIRD NO.259 - Male - Adult - from northeastern Deuel County. Shot June 5, 1929, at 7:15 P.M., near a corn field in which the corn was up about 4 inches. Pasture, sweet clover, meadow and small grain in surrounding fields. This bird was shot near a corn field which, a farmer claimed, had been damaged by pheasants.

Crop Contents

1 cutworm, sp?
11 kernels of corn, unsprouted
12 kernels of barley
4 kernels of oats
0.06 cc. conglomerate vegetation

Gizzard Contents

4 beetles
2 - No. 17
2 - sp?
6 cutworms, sp?
17 cutworm mandibles, sp?
0.2 cc. ground up insects, chiefly No.13
2 kernels of corn
7 kernels of barley
29 seeds yellow foxtail, No.25
3 fragments seeds of wild rose, No. 66
3 unidentified pods, seeds not developed
12 cc. hulls

270 stones = 2.7 cc

BIRD NO.260 - Female - Adult - from southeastern Grant County. Killed by an automobile, June 12, 1929, at 4:45 P.M., on a road between two meadows. Corn and small grain about 40 rods away.

Crop Contents

2 ants, No. 146	11 seeds green foxtail, No. 27
1 beetle mandible, No.17	22 seeds yellow foxtail, No. 25
1 millipede, No. 189	1 seed wild buckwheat, No. 42
	0.3 cc.conglomerate vegetation

Gizzard Contents

9 beetle mandibles	58 seeds green foxtail, No. 27
6 - No.17: 1 - No.13	210 seeds yellow foxtail, No. 25
2 - sp?	20 seeds sweet clover, No. 74
0.33 cc. ground up	18 seeds wild buckwheat, No. 42
beetles, sp?	6.5 cc.conglomerate vegetation
2 millipedes, No. 189	

456 stones = 2.3 cc.

BIRD NO.261 - Male - Adult - from northeastern Deuel County. Shot July 2, 1929, at 8:15 P.M., near the road, in a pasture. Corn field about 20 rods away and small grain fields adjoining the pasture. Bird apparently on its way to cover for the night.

Crop Contents

1 click beetle, No.67	5 kernels of corn & 16 fragments
1 fly, No. 171	599 kernels of barley
1 larva and 1 pupa of	17 kernels of oats
Hymenoptera, sp?	47 seeds of violet, No. 85
	3 blossoms, sp?
	2 unidentified seeds
	2.7 cc.conglomerate vegetation

Gizzard Contents

2 heads of snout beetles,	2 fragments of kernels of corn
No. 89	113 kernels of barley
1 beetle mandible, No.87	4 kernels of oats
1 beetle head, No. 81	1 seed panic grass, No. 22
1.6 cc.ground up beetles.	3 seeds of sedge, No. 35
mostly No. 81	4 seeds of violet, No. 85
	72 pits, No. 65
	21 unidentified seeds
	19.5 cc.conglomerate vegetation

237 stones = 3.5 cc

BIRD NO. 262 - Male - Adult - from west central Codington County. Shot July 13, 1929, at 7:00 P.M., in center of newly graded road. Surrounding fields were wheat and barley, all headed out.

Crop Contents

12 beetles: 1 - No.83
1 - No.72: 10 - No.73
4 wing covers, beetle, No.78
1 caterpillar, No. 182
2 grasshoppers, No. 98
1 grasshopper, sp?
1 kernel of corn
4 kernels of wheat
1 green foxtail hull, No. 27
2 seeds of millet, No. 26
20 seeds wood sorrel, No. 79
5 cc. conglomerate vegetation
1 stone

Gizzard Contents

1 beetle head, No.31
12 beetle mandibles
10 - No.17: 2 - No.86
3 cricket mandibles, sp?
36 cutworm mandibles, sp?
18 grasshopper mandibles, sp?
12 cc. ground up beetles & grasshoppers, sp?
2 kernels corn & 12 fragments
1 seed of bindweed, No. 90
1 seed yellow foxtail, No.25
1 seed millet, No. 26
8 seeds wood sorrel, No. 79
10.3 cc. conglomerate vegetation
177 stones = 3 cc.

BIRD NO.263 - Male - Adult - from central Codington County. Shot July 14, 1929, at 7:30 P.M. Feeding in road ditch bordering a cornfield in which the corn was about 2½ feet high. Headed barley on opposite side of corn field.

Crop Contents

5 beetles: 1 - No.43
1 - No.44: 1 - No.54
1 - No.17: 1 - No.89
1 broken up grasshopper nymph, sp?
1 broken up moth, sp?
1 spider, sp?
121 kernels of barley
1 seed of flax
1 seed wild oats, No. 8
0.3 cc. conglomerate vegetation

Gizzard Contents

1 head and 1 mandible of ants, sp?
1 head, snout beetle, No.89
13 beetles
5 - No.43: 1 - No.44
2 - No.45: 1 - No.56
1 - No.57: 1 - No.41
1 - No.17: 1 - No.61
33 kernels of barley
4 kernels of oats
14 seeds of bindweed, No. 90
3 seeds of buttercup, No. 55
2 seeds yellow foxtail, No.25
1 seed of vetch, No. 77
104 seeds wood sorrel, No. 79
15.8 cc. conglomerate vegetation

(BIRD NO.263 continued on next page)

(BIRD NO.263 - continued)

5 beetle heads
1 - sp? 4 - No. 17
16 beetle mandibles: 1 - No.31
13 - No.17: 2 - No.19
2 cc.ground up beetles,sp?
3 caterpillars: 1 - No.181
1 - No.175: 1 - No.183
1 head & 13 mandibles of caterpillars, sp?
1 mandible of cricket, sp?
2 heads, 6 mandibles of grasshoppers, sp?
4 Hymenoptera heads, sp?
1 moth, sp?
2 spiders, sp?

218 stones = 2.6 cc.

BIRD NO.264 - Male - Adult - from northeastern Clark County. Shot July 22, 1929, at 7:00 P.M., on road between corn field and meadow. Oats in shock adjoining the corn.

Crop Contents

1 spider, No.188

6 kernels of barley
58 kernels of oats
0.1 cc.conglomerate vegetation

Gizzard Contents

2 heads of snout beetles, No. 89
1 beetle, No. 86
2 beetle mandibles, No. 86
0.2 cc.ground up beetles, sp?
1 cutworm mandible, sp?

2 kernels of barley
28 kernels of oats
21 cc. oat hulls
1 seed wild buckwheat, No. 42
1 seed wild oats, No. 8

228 stones = 4.7 cc.

BIRD NO.265 - Male - Adult - from east central Codington County. Shot July 21, 1929, at 5:00 P.M., on road between two fields of green oats, surrounded by other small grain fields.

Crop Contents

None

Gizzard Contents

1 beetle mandible,sp?
10 grasshopper mandibles, sp?
0.05 cc.ground up beetles and grasshoppers,sp?

6 kernels of barley
2 kernels of oats
17 seeds yellow foxtail, No.25
1 seed wild rose, No.66
11.5 cc.conglomerate vegetation

310 stones = 3.9 cc.

BIRD NO.266 -Male - Adult - from southwestern Codington County. Shot August 3, 1929, at 6:30 P.M., on road. Shocked oats on both sides of road. Corn field adjoining oats.

Crop Contents

1 moth, sp?	60 kernels of barley
	178 kernels of oats
	8 kernels of wheat
	210 seeds green foxtail, No.27
	1 seed lamb's quarters, No.49
	0.6 cc.conglomerate vegetation

0.3 cc. of dirt

Gizzard Contents

1 beetle wing-cover,No.3	11 kernels of barley
4 beetle mandibles,sp?	31 kernels of oats
1 bug head, sp?	1 seed of bindweed, No. 90
1 cricket mandible,sp?	65 seeds green foxtail,No. 27
0.1 cc.ground up bugs and beetles, sp?	1 seed spreading pigweed,No.51
	13.4 cc.conglomerate vegetation

235 stones = 4 cc.

BIRD NO.267 - Male - Adult - from northeastern Grant County. Shot August 5, 1929, at 6:45 P.M., on the road. Bird flew to highway from shocked oats field. Corn field adjoining oats. Shocked oats on other side of road.

Crop Contents

1 beetle, No. 25	29 kernels of corn
5 grasshopper nymphs, sp?	1 kernel of wheat
	65 seeds green foxtail, No. 27
	9 seeds yellow foxtail, No.25
	0.15 cc.conglomerate vegetation

Gizzard Contents

1 bug head, sp?	2 kernels corn & 19 fragments
2 caterpillar mandibles,	2 kernels of wheat
1 head; 24 mandibles of grasshoppers, sp?	34 seeds green foxtail, No.27
	96 seeds yellow foxtail,No.25
2.9 cc.ground up grasshoppers, sp?	6 seeds of vetch, No. 77
	2 seeds wild buckwheat, No.42
	7.3 cc.conglomerate vegetation

400 stones = 3.2 cc

BIRD NO.268 - Female - Young - from east central Codington County. Shot August 12, 1929, at 6:15 P.M., in field of shocked oats. Oats in shock on opposite side of road. Sweet clover field about 20 rods away.

Crop Contents

2 kernels of barley
2 kernels of oats
40 seeds green foxtail, No.27
8 seeds yellow foxtail, No.25
0.05 cc.conglomerate vegetation

Gizzard Contents

2 ants, No. 156
1 ant head, sp?
3 beetle mandibles
1 - No.17: 2 -sp?
49 cricket mandibles,sp?
17 grasshopper mandibles, sp?
1.6 cc. broken up insects, mostly grasshoppers, sp?

25 kernels of barley
5 kernels of oats
1 seed barnyard grass, No.16
266 seeds green foxtail, No. 27
90 seeds yellow foxtail, No.25
66 seeds sweet clover, No. 74
2 seeds of vetch, No. 77
7 seeds wild buckwheat, No.42
6.1 cc.conglomerate vegetation

32 stones = 0.7 cc.

BIRD NO.269 - Female - Young - from southwestern Codington County. Shot August 13, 1929, at 8:15 A.M., in weeds along the road. Corn field on one side and small patch of millet and shocked barley on the other.

Crop Contents

1 snout beetle, No.89
6 beetles
3 - No. 86
1 - No. 1
2 - No. 17
3 field crickets,No.110
1 fly larva, sp?
1 robber fly, No.163
7 grasshopper nymphs
6 - No. 107
1 - No. 96
1 grasshopper mandible, sp?
1 Ichneumon fly, No.155
1 lace-wing fly, No.187

1 kernel of barley
6 kernels of wheat
93 seeds green foxtail, No. 27
1 seed yellow foxtail, No.25
0.4 cc. conglomerate vegetation

(BIRD NO.269 continued on next page)

(BIRD NO.269 - continued)

Gizzard Contents

5 ant heads, sp?	3 seeds of bindweed, No.90
28 beetle mandibles	492 seeds of green foxtail, No.27
26 - No.17: 2 - sp?	35 seeds yellow foxtail, No.25
4 cricket mandibles, sp?	11 seeds knotweed, No. 46
15 grasshopper mandibles, sp?	7.7 cc. conglomerate vegetation
1.3 cc. ground up crickets, beetles and grasshoppers, sp?	

93 stones = 0.9 cc.

BIRD NO.270 - Female - Young - from east central Spink County. Killed August 22, 1929, by an automobile and found at 10:30 A.M., on gravel road 2 miles east of Doland. Stubble fields on either side of the road.

Crop Contents

29 seeds green foxtail, No.27

Gizzard Contents

9 beetle mandibles	1 kernel of wheat
8 - No.17: 1 - No.13	594 seeds green foxtail, No.27
26 cricket mandibles, sp?	34 seeds yellow foxtail, No.25
1 field cricket, No.110	4 seeds knotweed, No. 46
0.5 cc. ground up crickets, sp?	1 seed wild buckwheat, No.42
2 grasshopper mandibles, sp?	5 cc. conglomerate vegetation

90 stones = 1.6 cc.

BIRD NO.271 - Male - Young - from central Clark County. Shot August 23, 1929, at 5:30 P.M., on road near a creek. Stubble and prairie at the sides of the road.

Crop Contents

None

Gizzard Contents

2 beetle mandibles, No.17	1 seed of alfalfa
12 cricket mandibles, sp?	22 seeds of sedge, No. 35
7 grasshopper mandibles, sp?	15 seeds wild buckwheat, No.42
1 Hymenopteron head, sp?	6.3 cc. conglomerate vegetation
0.5 cc. ground up crickets, grasshoppers & beetles, sp?	

57 stones = 2 cc.

BIRD NO. 272 - Male - Young - from central Clark County. Shot August 24, 1929, at 6:30 P.M., in a stubble field beside road. Stubble field on opposite side of road with two straw stacks. Bird had been feeding near the straw stacks before crossing the road.

Crop Contents

1 field cricket, No.110	67 kernels of wheat 0.4 cc. conglomerate vegetation

Gizzard Contents

42 beetle mandibles 40 - No. 17 2 - No. 86 3 heads and 21 mandibles of crickets, sp? 3.4 cc.ground up crickets, sp? 2 grasshopper mandibles, sp?	55 kernels of wheat 3 seeds green foxtail, No.27 22 seeds yellow foxtail, No.25 1 seed wild buckwheat, No.42 6.5 cc.conglomerate vegetation

100 stones = 2.2 cc.

BIRD NO.273 - Female - Adult - from northwestern Codington County. Shot September 3, 1929, at 9:15 A.M., along road with stubble field adjoining. Corn field about 10 rods away: a meadow across the road.

Crop Contents

2 field crickets,No.110 1 caterpillar, No.175 1 caterpillar head,sp?	38 kernels of wheat 1.5 cc.wheat chaff. 77 seeds yellow foxtail, No.25 1 seed wild buckwheat, No.42 1 seed wild oats, No. 8

Gizzard Contents

1 caterpillar mandible, sp? 1 field cricket, No.110 24 cricket mandibles,sp? 5 grasshopper mandibles, sp? 0.25 cc.ground up crickets & grasshoppers,sp?	1 kernel of corn 2 kernels of barley 30 kernels of wheat 2 seeds of bindweed, No.90 507 seeds yellow foxtail, No.25 6.5 cc.conglomerate vegetation

10 stones = 0.17 cc.

BIRD NO.274 - Male - Young - from west central Codington County. Shot September 11, 1929, at 10:40 A.M., on a duck pass between Lake Nicholson and Cooley's Lake. All prairie--very little grain within a quarter of a mile.

Crop Contents

2 ants, No.145
1 caterpillar, No.183
1 srider, No.188
1 kernel of barley
2 kernels of oats

Gizzard Contents

23 ant heads, sp?
1 beetle head, sp?
1 bug head, No.139
1 caterpillar mandible, sp?
83 cricket mandibles, sp?
1 grasshopper, No.93
1 head & 42 mandibles of grasshoppers, sp?
1 Hymenopteron head, sp?
1 spider, No.188
4.5 cc.ground up crickets and grasshoppers, sp?
12 kernels of barley
384 seeds green foxtail, No.27
7 seeds yellow foxtail, No.25
1 seed little ragweed, No.107
13 seeds Dakota vetch, No.70
2 seeds wild rose, No.66
10.5 cc.conglomerate vegetation

264 stones = 1.7 cc.

BIRD NO.275 - Female - Young - from south central Codington County. Killed September 11, 1929, by an automobile, and picked up at 6:15 P.M., on highway near Pelican Lake.

Crop Contents

1 queen ant, No.150
1 beetle, No.1
2 caterpillars
1 - No.183; 1 - No.177
2 field crickets, No.110
2 grasshoppers, No.103
2 millipedes, No.189
190 seeds green foxtail, No.27
5 seeds yellow foxtail, No.25
0.11 cc.conglomerate vegetation

Gizzard Contents

6 ant heads, sp?
1 caterpillar, No.183
1 caterpillar mandible, sp?
28 cricket mandibles, sp?
2 heads & 35 mandibles of grasshoppers, sp?
4.5 cc.ground up grasshoppers, sp?
1 millipede, No. 189
275 seeds green foxtail, No.27
42 seeds yellow foxtail, No.25
1 seed of knotweed, No.46
1 seed of smartweed, No.44
2 seeds sweet clover, No.74
3.6 cc.conglomerate vegetation

109 stones = 1 cc.

BIRD NO.276 - Male Young - from west central Codington County. Shot September 21, 1929, at 5:30 P.M., in grass along road. Cut corn field about 20 rods away: stubble field about same distance.

Crop Contents

29 kernels of barley
73 seeds green foxtail, No.27
11 seeds yellow foxtail, No.25
1 seed narrow-leaved puccoon, No.93
0.17 cc.conglomerate vegetation

Gizzard Contents

0.1 cc. ground up beetles, sp?

27 kernels of barley
5 kernels of oats
84 seeds green foxtail, No.27
112 seeds yellow foxtail, No.25
1 seed of puccoon, No.93
1 seed of sedge, No.35
1 seed of wild oats, No.8
3 seeds wild rose, No.66
12.3 cc.conglomerate vegetation

204 stones = 2.5 cc.

BIRD NO.277 - Male - Adult - from east central Hamlin County. Shot January 20, 1930, at 4:00 P.M., on road near Sioux River. Picked corn field about 40 rods away. Plowed field and meadow nearby. Bird feeding on the road.

Crop Contents

230 kernels of corn & 36 fragments
21 kernels of barley
4 kernels of oats
1 seed of flax
2 seeds of alfalfa
1 seed of buckwheat
42 seeds sweet clover, No.74
0.14 cc.conglomerate vegetation

Gizzard Contents

16 kernels of corn & 11fragments
3 kernels of barley
14 seeds sweet clover, No.74
1 seed wild rose, No.66
6 cc.conglomerate vegetation

605 stones = 4.4 cc.

BIRD NO.278 - Female - Adult - from Deuel County. Shot January 23, 1930, at 3:20 P.M., in ditch along graveled road. Picked corn and stubble field next to the road. Bird was on road for 30 minutes and seemed to be feeding there.

Crop Contents

1 leg of grasshopper,sp?	225 kernels of corn 56 kernels of barley 271 kernels of oats 2 kernels of wheat 1 seed barnyard grass, No.16 1 seed green foxtail, No. 27 2 seeds of wild oats, No. 8 1.5 cc.conglomerate vegetation

90 stones = 0.13 cc.

Gizzard Contents

2 grasshopper mandibles, sp? 0.38 cc.broken up grasshoppers, sp?	3 kernels of corn & 40 fragments 2 kernels of barley 17 kernels of oats 1 kernel of wheat 14 seeds of green foxtail,No.27 2 seeds of wild rose 1 seed of Symphoricarpos,sp., No. 105 10.2 cc.conglomerate vegetation

605 stones = 4.5 cc.

BIRD NO.279 - Male - Adult - from east central Grant County. Shot January 27, 1929, in grove of trees. No buildings near. Stubble fields all around grove and corn field about 40 rods away.

Crop Contents

4 kernels of corn 3 cc.corglomerate vegetation

Gizzard Contents

3 kernels of corn and 39 fragments 1 seed yellow foxtail, No.25 5.3 cc.conglomerate vegetation

310 stones = 2.5 cc.

BIRD NO.280 - Female - Adult - from east central Dav County. Shot February 11, 1930, at 4:10 P.M., in stubble field. Corn field about 80 rods north and plowed field across road.

Crop Contents

	11 kernels of barley
	30 kernels of oats
	50 kernels of rye
	79 seeds green foxtail, No.27
	392 seeds yellow foxtail, No.25
	1 seed sweet clover, No. 74
	27 seeds wild buckwheat, No.42
	9 seeds wild oats, No. 8
	0.38 cc.conglomerate vegetation

13 stones = 0.05 cc.
1 little blue bead

Gizzard Contents

2 bits of grasshopper leg, sp?	20 kernels of rye
	8 seeds green foxtail, No.27
	59 seeds yellow foxtail, No.25
	2 seeds little ragweed, No.107
	9 seeds sweet clover, No.74
	12 seeds wild buckwheat, No.42
	23 seeds wild rose, No. 66
	4 seeds of wolfberry, No.104
	4.4 cc.conglomerate vegetation

534 stones = 3 cc.

BIRD NO.281 - Male - Adult - from west central Codington County. Shot March 10, 1930, at 11:15 A.M., in stubble field. Picked corn field about 20 rods away--lakes and pasture adjoining.

Crop Contents

1 grasshopper, No.103	23 kernels of barley
3 segments of millipede, No. 189	518 seeds green foxtail, No.27
	4 seeds yellow foxtail, No.25
	3 cc.conglomerate vegetation

Gizzard Contents

1.5 cc. ground up grasshoppers, sp?	8 seeds barnyard grass, No.16
	3 seeds of bindweed, No. 90
	710 seeds green foxtail, No.27
	79 seeds yellow foxtail, No.25
	1 seed of vetch, No. 77
	11 seeds wild rose, No. 66
	10.3 cc.conglomerate vegetation

194 stones = 1.7 cc.

BIRD NO.301 - Male - Adult - from northeastern Hamlin County. Shot April 1, 1929, at 5:30 P.M., in slough grass, surrounded by alfalfa, cut corn and grain stubble.

Crop Contents

2 grasshopper legs, No. 107	68 kernels of corn 1 seed of buckwheat 5 seeds green foxtail, No.27 1 seed old-witch grass, No.19 1 seed wild buckwheat, No.42 3.5 cc.conglomerate vegetation

201 stones = 0.1 cc.
0.57 cc. of dirt

Gizzard Contents

2 grasshopper legs,sp? 4 grasshopper mandibles, sp?	4 kernels of corn & 8 fragments 1 seed green foxtail, No. 27 3 seeds yellow foxtail, No.25 1 seed rough pigweed, No. 52 1 seed little ragweed, No.107 55 seeds wild buckwheat, No.42 5 unidentified seeds 12 cc.conglomerate vegetation

439 stones = 4.2 cc.

BIRD NO.302 - Male - Adult - from central Hamlin County. Shot April 6, 1929, at 6:15 P.M. in stubble field, adjoining cut corn, picked corn and small patch of sweet clover.

Crop Contents

1 grasshopper of last year, No. 107 1 millipede, No. 189	217 kernels of oats 6 cc. oat hulls 2 seeds of cinquefoil , No.61 118 seeds green foxtail, No. 27 1 seed yellow foxtail, No. 25

Gizzard Contents

20 beetle mandibles,No. 17 0.17 cc. broken up beetles, No. 13	30 kernels of oats 13.4 cc. oat hulls 1 seed green foxtail, No. 27 4 seeds little ragweed, No.107 1 seed wild buckwheat, No. 42 64 seeds wild rose, No. 66 several unidentified seeds

82 stones = 1.1 cc.

BIRD NO. 303 - Male - Adult - from south central Hamlin County. Shot April 12, 1929, at 5:45 P.M. in a plowed field. Plowed fields on all sides. Three-quarters of a mile from any farm buildings.

Crop Contents

12 kernels of corn
12 kernels of wheat
1 cc. wheat chaff

Gizzard Contents

2 kernels corn & 8 fragments
30 kernels of wheat
7 seeds wild rose, No. 66
7.1 cc. conglomerate vegetation

441 stones = 3.3 cc.

BIRD NO. 304 - Male - Adult - from north central Kingsbury County. Shot April 19, 1929, at 5:30 P.M., in slough grass. Slough on all sides. No cultivated fields closer than a quarter of a mile.

Crop Contents

8 kernels of barley
61 kernels of oats
10 seeds wild oats, No. 8
1.25 cc. conglomerate vegetation

574 stones = 0.6 cc.

Gizzard Contents

0.04 cc. ground up beetles, No. 13

5 seeds of barley
12 kernels of oats
24.9 cc. oat hulls
3 seeds wild oats, No. 8
1 unidentified seed

369 stones = 5.4 cc.

BIRD NO. 305 - Male - Adult - from west central Deuel County. Shot May 5, 1929, at 4:45 P.M., in a plowed field, surrounded by plowed land.

Crop Contents

2 beetles
1 - No. 5
1 - No. 17

9 kernels of corn
42 kernels of barley
1 seed yellow foxtail, No. 25
1 seed rough pigweed, No. 52

0.25 cc. soil (including 39 small stones)

Gizzard Contents

1 ant, No. 150
1 beetle, No. 17
0.16 cc. ground up beetles, No. 13
1 millipede, No. 189

0.5 cc. fragments, kernels of corn
42 kernels of barley
1 seed yellow foxtail, No. 25
8 cc. conglomerate vegetation

391 stones = 4.5 cc.

BIRD NO. 306 - Female - Adult - from northwestern Brookings County. Shot May 13, 1929, at 6:10 P.M., in slough grass near water. On one side was a grass pasture, on other sides oats and barley.

Crop Contents

8 March-fly larvae No. 165	1 seed green foxtail, No. 27
1 midge, No. 168	58 seeds yellow foxtail, No.25
	0.05 cc.conglomerate vegetation

Gizzard Contents

63 beetle mandibles,No.13	2 seeds barnyard grass, No.16
2.5 cc.ground up beetles, mostly No. 13	4 seeds green foxtail, No. 27
	2 seeds of puccoon, No. 93
	26 unidentified seeds
	2.25 cc.vegetation, some yellow foxtail, No. 25

227 stones = 2.4 cc.

BIRD NO. 307 - Male - Adult - from northeastern Hamlin County. Shot May 21, 1929, at 6:10 P.M., on native grass pasture, three-quarters of a mile from farm buildings. Virgin prairie on two sides, oats on third side.

Crop Contents

3 cutworms, sp?	1 fragment of kernel of corn
	145 kernels of wheat,1 sprouted
	1 seed green foxtail, No. 27
	0.3 cc. leaves

Gizzard Contents

3 heads of snout beetles, No. 89	48 kernels of wheat
3 beetle mandibles	46 seeds yellow foxtail, No. 25
1 - No.17: 1 - No.31: 1 - sp?	1 seed wild buckwheat, No. 42
0.13 cc.ground up insects, mostly No. 89	10.2 cc.conglomerate vegetation
11 cutworm mandibles, sp?	

557 stones = 2.5 cc.

BIRD NO. 308 - Male - Adult - from northeastern Hamlin County. Shot May 30, 1929, at 7:30 P.M., in oat field. Corn field on one side, pasture on other. Warden observed bird moving around in corn field for about 10 minutes, after which the bird crossed over into the oat field.

Crop Contents

1 cutworm, sp?	86 kernels of corn, unsprouted 5 kernels of barley 0.3 cc. conglomerate vegetation

Gizzard Contents

1 ant, No. 150 11 beetle mandibles 9 - No. 17; 2 - No. 13 2 cutworm mandibles, sp? 1 millipede, No. 189 0.08 cc. ground up beetles and ants, sp?	9 kernels of corn & 40 fragments 11 kernels of barley 2 seeds yellow foxtail, No. 25 1 seed sweet clover, No. 74 1 seed wild oats, No. 8 1 seed wild rose, No. 66 11.3 cc. conglomerate vegetation

180 stones = 2.2 cc.

BIRD NO. 309 - Male - Adult - from north central Hamlin County. Shot June 7, 1929, at 6:45 P.M., in field planted to corn and adjoining oat and potato fields.

Crop Contents

13 cutworms, sp? 2 maggots, sp?	2 kernels of barley 82 kernels of oats 2 seeds yellow foxtail, No. 25 0.7 cc. conglomerate vegetation

Gizzard Contents

2 beetle heads, sp? 3 cutworms, sp? 1 head & 25 mandibles of cutworms, sp? 0.8 cc. ground up beetles and cutworm bodies, sp?	2 kernels of barley 40 kernels of oats 20 cc. oat hulls 8 seeds of bindweed, No. 90 2 seeds yellow foxtail, No. 25 1 seed wild buckwheat, No. 42

262 stones = 3.9 cc.

BIRD NO. 310 - Male - Adult - from north central Hamlin County. Shot June 15, 1929, at 7:15 P.M., in a corn field, surrounded by fields of alfalfa and oats.

Crop Contents

69 kernels of corn & 23 fragments
1 cc. conglomerate vegetation

Gizzard Contents

2 beetles
1 - No.19: 1 - No.11
24 beetle mandibles
12 - No.11: 6 - No.19:
2 - No.87: 1 - No.17:
3 - sp?
1.75 cc. ground up beetles, sp?
1 army worm, No.180
8 cutworms, sp?
4 spiders, No. 188
7 kernels of corn & 6 fragments
1 seed of violet, No. 85
1 seed of wild rose, No. 66
2 unidentified seeds
0.5 cc. flower buds
11.6 cc. conglomerate vegetation

123 stones = 2.3 cc.

BIRD NO. 311 - Male - Adult - from northeastern Hamlin County. Shot June 24, 1929, at 7:20 P.M., in a barley field, adjoining a corn field. Surrounding fields were of sweet clover, oats and barley.

Crop Contents

1 snout beetle, No.89
6 beetles, No. 17
1 click beetle, No. 67
1 plant bug, No. 131
1 bug head, sp?
1 spider, No. 188
0.07 cc. broken up beetles and spiders, sp?
203 kernels of barley
59 kernels of oats
35 kernels of wheat
1 seed green foxtail, No. 27
1 seed yellow foxtail, No. 25
1 seed little ragweed, No. 107
12 seeds wild oats, No. 8
2.7 cc. conglomerate vegetation

39 stones = 0.05 cc.

Gizzard Contents

1 head & 1 mandible of ant, sp?
3 beetles, No. 17
1 click beetle, No. 67
2 beetle heads
1 - No.17: 1 - No.78
149 beetle mandibles
145 - No.17: 2 sp?
2 - No.31
0.25 cc. ground up beetles, No.17
1.5 cc. ground up beetles, sp?
4 cricket mandibles, sp?
9 cutworm mandibles, sp?
1 grasshopper, sp?
64 kernels of barley
8 kernels of wheat
2 seeds of bindweed, No. 90
6 seeds of wild rose, No. 66
11 cc. conglomerate vegetation

475 stones = 2.9 cc.

BIRD NO. 312 - Female - Adult - from east central Hamlin County. Shot July 3, 1929, at 6:45 P.M., in edge of a barley field, adjoining fields of corn, oats and flax.

Crop Contents

1 stink-bug nymph, No. 135	44 kernels of barley 1 kernel of oats 21 seeds, 2 flowers of flax 2 seeds green foxtail, No. 27 1 seed yellow foxtail, No. 25 1 composite bud, sp? 0.6 cc.conglomerate vegetation

4 small stones

Gizzard Contents

1 ant head, sp? 1 snout beetle, No.89 1 beetle, No. 47 1 beetle head, No. 17 1 beetle mandible, sp? 5 grasshopper mandibles, sp? 0.2 cc.ground up beetles and grasshoppers, sp?	12 kernels of barley 18 seeds of flax 2 fragments of kernels of oats 12 seeds of ellisia, No. 92 13 seeds green foxtail, No. 27 4 seeds yellow foxtail, No. 25 3 seeds of vetch, No. 77 1 seed wild buckwheat, No. 42 5 seeds wild rose, No. 66 3 seeds wood sorrel, No. 79 11.5 cc.conglomerate vegetation

307 stones = 2.8 cc.

BIRD NO. 313 - Male - Adult - from central Hamlin County. Shot July 17, 1929, at 6:35 P.M., in oat field which was in corn last year. Barley on one side, corn on the other side.

Crop Contents

8 kernels of corn 30 kernels of barley 0.4 cc.conglomerate vegetation

Gizzard Contents

2 beetles, No. 44 1 beetle, No. 86 10 beetle mandibles 5 - No.19: 1 - No.17 4 - sp? 0.2 cc.ground up beetles, sp? 1 head & 3 mandibles of caterpillars, sp? 12 grasshopper mandibles, sp?	6 kernels of corn 7 kernels of barley 1 seed yellow foxtail, No. 25 4 seeds of vetch, No. 77 13.5 cc.conglomerate vegetation

106 stones = 1.9 cc.

BIRD NO. 314 - Female - Adult - from northeastern Hamlin County. Shot July 23, 1929, at 6:40 P.M., in the edge of an oat field. Barley field adjoining oats: corn field across the road.

Crop Contents

None

Gizzard Contents

20 grasshopper mandibles, sp?	6 kernels of barley
0.57 cc. ground up grasshoppers, sp?	1 seed of catchfly, No.53
	5 seeds yellow foxtail, No.25
	1 seed of Dakota vetch, No.70
	1 seed wild buckwheat, No.42
	3 seeds of wood sorrel, No.79
	9 cc.conglomerate vegetation

188 stones = 3 cc.

BIRD NO. 315 - Male - Adult - from east central Hamlin County. Shot July 27, 1929, at 6:50 P.M., in edge of field of barley: fields of alfalfa, oats and corn adjoining.

Crop Contents

4 kernels of barley

Gizzard Contents

1 head snout beetle, No.89	18 kernels of barley
0.25 cc.ground up beetles sp?	3 seeds green foxtail, No.27
1 cutworm head, sp?	2 seeds yellow foxtail, No.25
1 grasshopper, No. 98	1 seed of rush, No. 36
1 head & 7 mandibles of grasshoppers, sp?	2 seeds of sedge, No. 35
1 moth head, sp?	6 seeds switch grass, No.21
	20 seeds wild buckwheat, No.42
	3 unidentified seeds
	12 cc.conglomerate vegetation

247 stones = 3.2 cc.

BIRD NO. 316 - Male - Adult - from east central Hamlin County. Shot August 1, 1929, at 7:10 P.M., in barley field. Adjoining fields were in oats, corn and sweet clover.

Cro pContents

7 seeds green foxtail, No.27

Gizzard Contents

1 grasshopper, No. 98	44 seeds green foxtail, No.27
2 grasshopper mandibles, sp?	42 seeds yellow foxtail, No.25
0.38 cc.ground up grasshoppers, sp?	5.5 cc.conglomerate vegetation.
2 maggots, sp?	

193 stones = 4.5 cc.

BIRD NO.317 - Male - Adult - from east central Hamlin County. Shot August 13, 1929, at 6:40 P.M., in a barley field. Oat field on one side, corn on the other.

Crop Contents

1 kernel of barley
8 kernels of oats
20 kernels of rye
99 seeds of green foxtail, No. 27
205 seeds yellow foxtail, No. 25
0.5 cc.conglomerate vegetation

Gizzard Contents

2 kernels of oats
13 kernels of rye
16 seeds green foxtail, No. 27
406 seeds yellow foxtail, No.25
6.8 cc.conglomerate vegetation

58 stones = 1.2 cc.

BIRD NO. 318 - Female - from northwestern Brookings County. Shot August 15, 1929. at 6:50 P.M., in barley field near a slough. Corn field 20 rods from where bird was killed: oat field across road.

Crop Contents

73 kernels of barley
2 kernels of oats
3 seeds of ellisia, No. 92
151 seeds green foxtail, No.27
133 seeds yellow foxtail, No.25
4.5 cc.conglomerate vegetation

Gizzard Contents

1 head and thorax of snout beetle, No.89	23 kernels of barley
2 caterpillar mandibles, sp?	6 seeds of bindweed, No. 90
8 grasshopper mandibles, sp?	3 seeds of ellisia, No.92
0.25 cc.ground up beetles and grass-hoppers, sp?	150 seeds green foxtail, No. 27
	206 seeds yellow foxtail, No.25
	1 seed wild rose, No. 66
	2 seeds wood sorrel, No. 79
	15 cc.conglomerate vegetation

164 stones = 2.2 cc.

BIRD NO. 319 - Female - Adult - from northwestern Brookings County. Shot August 21, 1929, at 7:00 P.M., in the edge of an oat field which was in shock. Adjoining fields were barley, corn and sweet clover.

Crop Contents

3 grasshoppers	12 kernels of barley
1 - No.98	162 kernels of oats
1 - No. 106	20 seeds barnyard grass, No.16
1 - No. 107	17 seeds green foxtail, No.27
	336 seeds yellow foxtail, No.25
	10 seeds ground cherry, No. 97
	1 seed sweet clover, No. 74
	0.3 cc. conglomerate vegetation

Gizzard Contents

1 head & 5 mandibles of crickets, sp?	3 kernels of barley
6 grasshopper mandibles, sp?	10 kernels of oats
1.6 cc. ground up crickets & grasshoppers, sp?	125 seeds barnyard grass, No.16
	3 seeds of bindweed, No. 90
	14 seeds green foxtail, No.27
	676 seeds yellow foxtail, No.25
	22 seeds of gaura, No. 87
	172 seeds ground cherry, No.97
	4 seeds sweet clover, No. 74
	1 seed milk vetch, No. 68
	4 seeds of water plantain, No.4
	13.2 cc. conglomerate vegetation

88 stones = 1.8 cc.

BIRD NO. 320 - Young - from central Hamlin County. Shot September 1, 1929, at 6:15 P.M., in a recently threshed wheat field adjoining fields of corn and sweet clover.

Crop Contents

1 leaf bug, No. 128	116 kernels of wheat
1 fly, sp?	1.1 cc. wheat chaff

Gizzard Contents

2 beetle mandibles, No.17	36 kernels of wheat
1 caterpillar mandible, sp?	3 seeds lady's thumb, No. 45
0.57 cc. broken up crickets, sp ?	5.6 cc. conglomerate vegetation
2 grasshopper mandibles, sp?	1 seed yellow foxtail, No. 25
2 cricket mandibles sp?	

189 stones 2 cc.

BIRD NO. 321 - Male - Young - from east central Hamlin County. Shot September 5, 1929, at 9:40 A.M., in the edge of a millet field adjoining a field of corn. Cut fields of barley, oats and sweet clover were nearby.

Crop Contents

	4 seeds barnyard grass, No.16
	764 seeds green foxtail, No.27
	1341 seeds yellow foxtail, No.25
	1 seed sweet clover, No. 74
	3.5 cc. conglomerate vegetation

Gizzard Contents

	1 seed barnyard grass, No.16
	555 seeds green foxtail, No.27
	677 seeds yellow foxtail, No.25
	13.9 cc. conglomerate vegetation

96 stones = 2.2 cc.

BIRD NO. 322 - Male - Young - from central Hamlin County. Shot September 22, 1929, at 6:15 P.M., in the edge of a corn field near a grassy slough and only a short distance from a sweet clover field.

Crop Contents

179 ants (154 queens), No.150	4 kernels of corn
1 leaf bug, No. 128	1 kernel of barley
6 field crickets, No.110	1 seed barnyard grass, No. 16
8 grasshoppers	3 seeds green foxtail, No. 27
3 - No.98; 5 - No.103	1 seed Marsh elder, No.115
1 katydid, No.113	3 seeds little ragweed, No.107
1 tree cricket, No.112	1 cc conglomerate vegetation
1 cc. ant wings and cricket legs	

Gizzard Contents

1 ant, No. 151	2 kernels of corn & 10 fragments
4 queen ants, No.150	1 kernel of barley
158 ant heads, sp?	3 seeds barnyard grass, No.16
2 heads & 3 mandibles of caterpillars, sp?	2 seeds brome grass, No. 11
5 heads & 9 mandibles of crickets, sp?	4 seeds green foxtail, No.27
2 grasshoppers	1 seed yellow foxtail, No.25
1 - No.98; 1 - No.103	32 seeds little ragweed, No.107
1 katydid, No.114	1 seed of sweet clover, No.74
1 head & 15 mandibles of grasshoppers, sp?	7.6 cc. conglomerate vegetation
8.2 cc. ground up ants, crickets & grasshoppers	

131 stones = 1.2 cc.

BIRD NO. 323 - Male - Adult - from central Hamlin County. Shot October 1, 1929, at 6:40 P.M., in a stubble field, next to a corn field and across the road from sweet clover patch.

Crop Contents

- 3 ants, No. 150
- 1 ambush bug, No. 138
- 8 field crickets, No.110
- 117 fly larvae
  - 113 - No. 165
  - 4 - sp?
- 17 grasshoppers
  - 16 - No. 103
  - 1 - No. 102
- 0.38 cc. broken up grasshoppers, sp?
- 16 kernels of corn
- 2 kernels of barley
- 4 kernels of oats
- 57 kernels of wheat
- 5 seeds barnyard grass, No.16
- 37 seeds beggar ticks, No.111
- 934 seeds green foxtail, No.27
- 20 seeds yellow foxtail, No.25
- 13 seeds marsh elder, No.115
- 3 seeds of milkweed, No.88
- 2 seeds of old-witch grass, No.19
- 1 seed rough pigweed, No.52
- 141 seeds little ragweed, No.107
- 1 seed of vervain, No. 94
- 11 seeds wild buckwheat, No.42
- 181 seeds wild sunflower, No.114
- 1 unidentified seed
- 5 cc.corglomerate vegetation

Gizzard Contents

- 5 beetle mandibles, sp?
- 1 stink-bug, No. 136
- 1 caterpillar mandible, sp?
- 42 cricket mandibles
  - 40 - No. 110
  - 2 - No. 111
- 2 heads & 39 mandibles of grasshoppers, sp?
- 3.7 cc. ground up grasshoppers, sp ?
- 1 kernel of oats
- 20 kernels of rye
- 3 seeds barnyard grass
- 1 seed of birdweed, No.90
- 137 seeds green foxtail
- 43 seeds yellow foxtail, No.25
- 3 seeds marsh elder, No.115
- 4 seeds old-witch grass, No.19
- 60 seeds little ragweed, No.107
- 10 seeds wild buckwheat, No.42
- 1 seed wild oats, No. 8
- 4 seeds wild rose, No. 66
- 53 seeds wild sunflower, No.114
- 14 cc.conglomerate vegetation

199 stones = 2.5 cc.

BIRD NO. 324 - Sex and age unknown - from northeastern Hamlin County. Shot October 4, 1929, at 5:40 P.M., in a sweet clover field adjoining a corn field.

Crop Contents

8 grasshoppers, No.103	43 kernels of corn 781 seeds green foxtail, No.27 12 seeds yellow foxtail, No.25 13 seeds knotweed, No. 46 22 seeds little ragweed, No. 107 5 cc. conglomerate vegetation

Gizzard Contents

6 beetle mandibles, No.17 1 cricket mandible, sp? 1 grasshopper, No. 103 27 grasshopper mandibles, sp? 0.38 cc. ground up grasshoppers, sp?	2 kernels of corn & 18 fragments 138 seeds green foxtail, No. 27 46 seeds yellow foxtail, No. 25 153 seeds of knotweed, No. 46 150 seeds little ragweed, No.107 7 seeds of sedge, No. 35 7 seeds of sweet clover, No. 74 1 seed wild buckwheat, No. 42 28 seeds of wild tomato, No.100 4 seeds of wolfberry, No. 104 9.4 cc. conglomerate vegetation

228 stones = 1.7 cc.

BIRD NO. 325 - Male - Adult - from central Kingsbury County. Shot October 6, 1929, at 5:45 P.M., in a sweet clover patch on the edge of a willow grove, near a corn field.

Crop Contents

None

Gizzard Contents

1 beetle mandible, No.17 4 cricket mandibles, sp? 1 grasshopper mandible, sp? 3 plant lice, No. 118 0.17 cc. ground up beetles, crickets & grasshoppers, sp?	77 seeds of sedge, No. 35 4 seeds sweet clover, No. 74 8.4 cc. conglomerate vegetation

132 stones = 3.3 cc.

BIRD NO. 326 - Male - Adult - from northeastern Hamlin County. Shot October 17, 1929, at 5:45 P.M., in a sweet clover patch adjoining corn and a potato patch. Across the road was a field of unplowed stubble. (Oats)

Crop Contents

8 field crickets, No.110	30 kernels of corn
1 grasshopper, No.103	55 seeds green foxtail, No. 27
	7 seeds yellow foxtail, No.25
	1 seed lamb's quarters, No.49
	0.2 cc.conglomerate vegetation

Gizzard Contents

24 cricket mandibles,sp?	3 kernels of corn &29 fragments
13 grasshopper mandibles, sp?	29 seeds green foxtail, No. 27
2.7 cc.ground up crickets & grasshoppers, sp?	110 seeds yellow foxtail,No. 25
	1 seed of wild oats, No. 8
	4 seeds wild rose, No. 66
	10 cc.conglomerate vegetation

285 stones = 2.9 cc.

BIRD NO. 327 - Male - Adult - from southeastern Hamlin County. Shot October 22, 1929, at 5:30 P.M., in sweet clover field, across the road from a corn field.

Crop Contents

3 field crickets,No.110	6 seeds of alkali grass, No.15
112 crickets, No. 111	5 seeds barnyard grass, No.16
0.11 cc. broken up crickets, No. 111	12 seeds small rush grass,No.29
4 grasshoppers, No. 103	3.3 cc.conglomerate vegetation
1 spider, No. 188	

Gizzard Contents

8 crickets, No. 111	31 seeds alkali grass, No. 15
7 heads & 105 mandibles of crickets, No. 111	1 seed yellow foxtail, No.25
5 cricket mandibles,No.110	4 seeds old-witch grass,No.19
2 grasshoppers, No. 103	1 seed of puccoon, No. 93
30 grasshopper mandibles,sp?	53 seeds small rush grass,No.29
2.7 cc.ground up crickets & grasshoppers, mostly crickets, sp?	9 seeds of sedge, No. 35
	32 seeds wild rose, No. 66
	16 seeds wolfberry, No. 104
	11.4 cc.conglomerate vegetation

253 stones = 2.3 cc.

BIRD NO. 328 - Male - Adult - from west central Brookings County. Shot October 26, 1929, at 5:35 P.M., in oat stubble between two corn fields, one of which had been machine picked.

Crop Contents

1 beetle, No. 77	117 kernels of corn
1 fly larva, No. 165	14 kernels of emmer
	23 seeds green foxtail, No.27
	2 seeds yellow foxtail, No.25
	9 seeds false timothy, No.10
	1 seed wild sunflower, No.114
	8 cc. grass leaves

Gizzard Contents

4 grasshopper mandibles, sp?	1 kernel of corn & 22 fragments
0.5 cc. ground up grasshoppers, sp?	11 kernels of emmer
	191 seeds green foxtail, No. 27
	20 seeds yellow foxtail, No. 25
	12 seeds of knotweed, No. 46
	1 seed little ragweed, No.107
	1 seed of red clover
	205 seeds sweet clover, No. 74
	2 seeds Dakota vetch, No. 70
	20 seeds wild rose, No. 66
	29.5 cc. conglomerate vegetation

579 stones = 3.3 cc.

BIRD NO. 329 - Male - Adult - from west central Brookings County. Shot November 8, 1929, at 4:45 P.M., in barley stubble, adjoining fields of corn and alfalfa.

Crop Contents

1 grasshopper, No.103	7 kernels of barley
1 spider, No. 188	1 seed of flax
	2 seeds green foxtail, No. 27
	1 seed yellow foxtail, No. 25
	44 seeds wild oats, No. 8
	0.72 cc. conglomerate vegetation

Gizzard Contents

1 cricket head, sp?	6 seeds green foxtail, No. 27
1 head & 14 mandibles of grasshoppers, sp?	38 seeds yellow foxtail, No. 25
1.2 cc. ground up crickets & grasshoppers, sp?	14 seeds wild oats, No. 8
	16 seeds wild rose, No. 66
	10.5 cc. conglomerate vegetation, some wild oat hulls

207 stones = 2.7 cc.

BIRD NO. 330 - Male - Adult - from west central Brookings County. Shot November 17, 1929, at 4:40 P.M., in corn field near a grass slough and a few rods from barley stubble.

Crop Contents

1 beetle, No. 9	159 kernels of corn
5 March-fly larvae.No. 165	65 seeds green foxtail, No. 27
5 grasshoppers	15 seeds yellow foxtail,No. 25
4 - No. 103	163 seeds of millet, No. 26
1 - No. 102	1 seed Russian thistle, No. 50
	3.2 cc.conglomerate vegetation

Gizzard Contents

30 grasshopper mandibles, sp?	5 kernels of corn & 5 fragments
0.25 cc. ground up grasshoppers, sp?	4 seeds of bindweed, No. 90
	53 seeds green foxtail, No. 27
	23 seeds yellow foxtail, No.25
	294 seeds of millet, No. 26
	1 seed Dakota vetch, No. 70
	1 seed wild buckwheat, No.42
	13.9 cc.conglomerate vegetation

360 stones = 2.5 cc.

BIRD NO. 351 - Male - Adult - from central Lake County. Shot April 5, 1929, at 9:00 A.M., in barley stubble. Surrounding areas: pasture, picked corn field, slough and barley field.

Crop Contents

13 kernels of corn
1.2 cc.conglomerate vegetation, some grass leaves

3 stones = 0.05 cc.

Gizzard Contents

0.2 cc. ground up beetles, No. 75	5 kernels of corn
	1 seed yellow foxtail, No. 25
	7 seeds of knotweed, No. 46
	22 seeds wild rose, No. 66
	13 cc. grass leaves and corn bran

283 stones = 3.9 cc.

BIRD NO. 352 - Male - Adult - from central Lake County. Shot April 30, 1929, at 4:30 P.M., in stubble sown down to sweet clover, adjoining corn land, native prairie and highway.

Crop Contents

	6 kernels of corn
	2 seeds yellow foxtail, No.25
	0.11 cc.conglomerate vegetation

Gizzard Contents

5 beetle mandibles, sp?	1 kernel of corn, 12 fragments
0.05 cc. particles of beetle, sp?	1 seed barnyard grass, No. 16
	1 seed of bindweed, No. 90
	7 seeds green foxtail, No. 27
	231 seeds yellow foxtail, No. 25
	1 seed of sandcherry, No. 63
	1 seed of smartweed, No. 44
	21 seeds wild buckwheat, No. 42
	3 seeds wild rose, No. 66
	2 unidentified seeds
	11 cc.conglomerate vegetation

374 stones = 4 cc.

BIRD NO. 353 - Female - Adult - from northeastern Lake County. Shot May 3, 1929, at 5:00 P.M., on rolling prairie land, surrounded by oats stubble, a field being plowed for corn and a last year's corn field, disced but not seeded.

Crop Contents

1 click beetle, No. 67	19 kernels of barley
1 cutworm, sp?	0.33 cc.conglomerate vegetation
93 March-fly larvae, No.165	
2 segments, millipede, No.189	
0.17 cc. pheasant egg shell	

Gizzard Contents

15 ant heads, sp?	53 kernels of barley
2 beetles	1 seed of bindweed, No. 90
1 - No.77: 1 - No.13	1 seed green foxtail, No. 27
3 beetle heads	1 seed yellow foxtail, No. 25
1 - No.89: 2 - sp?	half of plum pit, No. 62
46 beetle mandibles, sp?	1 seed wild liquorice, No. 69
2 cc.ground up insects, sp?	3 seeds wild rose, No. 66
0.05 cc. pheasant egg shell	8 cc.conglomerate vegetation

411 stones = 3.3 cc.

BIRD NO. 354 - Male - Adult-from central Lake County. Feeding on corn scattered over highway. Killed by car May 8, 1929, at about 12:30 P.M.

Crop Contents

Remains of 1 insect larvae, sp?	46 kernels of corn 48 kernels of barley 10 kernels of oats 0.5 cc. leaves, sp?

124 stones = .035 cc.

Gizzard Contents

2 beetle mandibles, No. 13 0.04 cc. ground up beetle parts, No.13	7 kernels of corn & 5 fragments 7 kernels of barley 6 seeds wild rose and 6 fragments, No. 66 2 unidentified seeds 12 cc.conglomerate vegetation

486 stones = 3.7 cc.

BIRD NO. 355 - Male - Adult - from north central Lake County. Shot May 18, 1929, at 5:30 P.M., on ground sown to oats: grain up about half an inch. Adjoining the oats were newly planted fields of corn, one of which was up.

Crop Contents

a few leaves, sp?

Gizzard Contents

2 beetle heads 1 - No.17: 1 - sp? 13 beetle mandibles 11- No.17: 2 - No.13 0.38 cc.ground up beetles, sp?	1 seed green foxtail, No. 27 9 seeds yellow foxtail,No. 25 fragments of 2 sandcherry pits, No. 63 7.5 cc. conglomerate vegetation

370 stones = 3.7 cc.

BIRD NO. 356 - Male - Adult - from north central Lake County. Shot May 24, 1929, at 6:15 P.M., in a creek bed. Surrounding areas were of prairie land, old meadow, quite a little old corn remaining in a field, new corn (just planted) and oat field (up about half an inch).

Crop Contents

1 caterpillar, No.183	23 kernels of corn,unsprouted

Gizzard Contents

1 head & 3 mandibles of beetles,sp? 0.5 cc.ground up beetles, sp?	6 kernels of corn & 38 fragments 5 seeds yellow foxtail,No. 25 4 seeds wild buckwheat, No.42 1 wild rose hull, No. 66 7.3 cc.conglomerate vegetation

391 stones = 3.8 cc.

BIRD NO. 357 - Male - Adult - from northwestern Moody County. Shot May 31, 1929, at 4:30 P.M., in corn field in which the grain was up about 1.5 inches: field cultivated once. Adjoining this field were two more fields of corn (one of which was in corn last year also), and wild prairie. Bird was feeding in corn field. Farmer said he suffered considerable loss last year.

Crop Contents

7 beetles, No. 71	15 kernels of corn (11 definitely unsprouted, 4 questionably so

Gizzard Contents

1 head, snout beetle, No.89	6 kernels of corn & 52 fragments
1 beetle, No. 45	1 kernel of barley
5 beetle heads	1 kernel of oats
1 - No.17: 3 - No.81	16 seeds bindweed, No. 90
1 - sp?	13 seeds yellow foxtail, No. 25
11 beetle mandibles, No.17	9 seeds wild rose & 1 hull,
3.4 cc. ground up beetles,	No. 66
mostly Nos.13 & 81	6.8 cc. conglomerate vegetation

154 stones = 2.3 cc.

BIRD NO. 358 - Male - Adult - from north central Lake County. Shot June 7, 1929, at 3:00 P.M., in an old pasture, seeded to alfalfa and timothy; not much cover. Next to this field were fields of new oats and barley, both of which had been in corn last year.

Crop Contents

1 March-fly, No. 165	1 kernel of corn
	6 kernels of barley
	6 seeds of flax
	1 kernel of wheat
	1 seed lamb's quarters, No.49
	0.5 cc. leaves, sp?

Gizzard Contents

1 ant head, sp?	3 kernels of corn & 8 fragments
19 heads, snout beetle, No.89	8 kernels of barley
3 beetle heads, sp?	34 seeds of dandelion, No. 117
4 beetle mandibles, No.17	3 seeds yellow foxtail, No. 25
0.2 cc. ground up beetles,	16 seeds wild rose, No. 66
sp?	15.2 cc. conglomerate vegetation
8 cutworms, sp?	
1 head & 31 mandibles of	
cutworms, sp?	

423 stones = 4.1 cc.

BIRD NO. 359 - Male - Adult - from southeastern Lake County. Shot June 29, 1929, at 9:00 A.M., in old pasture land, near creek. Surrounding areas: large oat field just heading out, corn and wild hay land.

Crop Contents

None

Gizzard Contents

1 ant, No. 150
8 heads & 4 mandibles of ants, sp?
2 beetle heads, No. 17
75 beetle mandibles
55- No. 17; 11 - sp?
4 - No.31; 2 - No.19
2 - No.11; 1 - No.86
3 cc.ground up beetles, Nos. 17, 19 and 31
6 cricket mandibles, sp?
3 cutworm mandibles, sp?
1 grasshopper, No. 99
18 grasshopper mandibles, sp?
2 seeds of bed straw, No. 103
1 seed of puccoon, No. 93
9.2 cc.conglomerate vegetation

341 stones = 2.5 cc.

BIRD NO. 360 - Male - Adult - from southwestern Lake County. Shot July 17, 1929, at 6:30 P.M., in an alfalfa field with a creek bed running thru it. Surrounding areas: large field of oats nearly ready to cut, corn field (corn 3 feet high), and wild prairie land.

Crop Contents

46 kernels of wheat
2 cc. wheat chaff

Gizzard Contents

1 snout beetle, No.89
0.03 cc.ground up snout beetles, No. 89
1 caterpillar mandible, sp?
29 kernels of wheat
3 seeds green foxtail, No.27
1 seed panic grass, No. 22
3 unidentified seeds
21 cc.conglomerate vegetation

285 stones = 4.8 cc.

BIRD NO. 361 - Male - Adult - from west central Lake County. Shot July 21, 1929, at 6:30 P.M., on rough prairie land in Winfred hills. Small grain fields scarce and few cornfields.

Crop Contents

1 leaf beetle, No. 46	51 kernels of barley
1 leaf bug, No. 128	2 seeds of peppergrass, No. 56
	0.4 cc. conglomerate vegetation

Gizzard Contents

1 beetle head, sp?	30 kernels of barley
4 beetle mandibles	1 seed of bindweed, No. 90
2 - No. 13: 2 - sp?	1 seed of smartweed, No. 44
0.2 cc. ground up beetles, sp?	13.1 cc. conglomerate vegetation
2 grasshopper mandibles, sp?	

728 stones : 6 cc.

BIRD NO. 362 - Female - Adult - from northwestern Lake County. Shot July 26, 1929, at 10:00 A.M., in barley field which was in shock. Adjoining were fields of barley, corn and pasture land.

Crop Contents

106 kernels of barley
0.3 cc. conglomerate vegetation

1 small stone

Gizzard Contents

2 ants, No. 150	23 kernels of barley
2 wasps, No. 158	1 seed green foxtail, No. 27
1 bee head, No. 158	1 seed of puccoon, No. 93
1 beetle abdomen, No. 31	23 seeds wild buckwheat, No. 42
10 beetle heads,	82 seeds wood sorrel, No. 79
1 - sp?: 5 - No. 17	13 cc. conglomerate vegetation
3 - No. 31: 1 - No. 78	
23 beetle mandibles	
19 - No. 17: 2 - No. 31	
2 - No. 86	
1 stink-bug, No. 136	
2 bug heads, sp?	
2 caterpillar mandibles, sp?	
3 heads & 15 mandibles of grasshoppers, sp?	
2 spiders, No. 188	
2.2 cc. ground up beetles, bugs & grasshoppers, sp?	

137 stones = 3.1 cc.

BIRD NO. 363 - Male - Adult - from northwestern Lake County. Shot July 30, 1929, at 3:00 P.M., in a field of shocked oats. Sweet clover field on one side, barley in shock on another, and corn on the other two sides.

Crop Contents

	1 kernel of barley
	83 kernels of oats
	6 kernels of wheat
	0.2 cc. conglomerate vegetation

Gizzard Contents

1 grasshopper mandible, sp?	22 kernels of oats
0.25 cc. ground up grasshoppers, sp?	57 kernels of wheat
	36 seeds green foxtail, No. 27
	1 water fern sporocarp, No. 1
	4 cc. conglomerate vegetation

126 stones = 2.8 cc.

BIRD NO. 364 - Male - Adult - from southwestern Lake County. Shot August 14, 1929, at 6:30 P.M., in a barley field: Vermillion hills to the east. Oat field, corn, alfalfa and creek nearby.

Crop Contents

1 cucumber beetle, No. 33	26 kernels of barley
1 tree cricket, No. 112	61 kernels of oats
	313 kernels of rye
	34 seeds green foxtail, No. 27
	2 seeds wild buckwheat, No. 42
	27 cc. leaves, sp?

7 small stones

Gizzard Contents

1 snout beetle, No. 89	1 kernel of barley
3 leaf beetles	74 kernels of oats
2 - No. 44: 1 - No. 43	5 kernels of rye
2 leaf beetle heads, No. 31	51 seeds green foxtail, No. 27
1 beetle head, sp?	27 seeds yellow foxtail, No. 25
1 beetle mandible, No. 17	1 seed wild buckwheat, No. 42
2 heads & 1 mandible of caterpillar, sp?	11 unidentified seeds
	14 cc. conglomerate vegetation
1 grasshopper mandible, sp?	
0.2 cc. ground up beetles, spiders & caterpillars	

558 stones = 8.3 cc.

BIRD NO. 365 - Male - Adult - from central Lake County. Shot September 5, 1929, at 8:00 A.M., in barley stubble. Adjoining the stubble were fields of corn, oats, alfalfa and hay.

Crop Contents

	16 seeds yellow foxtail, No.25

Gizzard Contents

2 beetle mandibles, No.13	13 seeds green foxtail, No. 27
10 grasshopper mandibles, sp?	517 seeds yellow foxtail, No.25
0.75 cc. ground up grasshoppers	3 seeds of knotweed, No. 46
	13 seeds sweet clover, No. 74
	3 seeds wild buckwheat, No.42
	6 unidentified seeds
	6.9 cc. conglomerate vegetation

98 stones = 2.7 cc.

BIRD NO. 366 - Male-Adult - from west central Moody County. Shot September 14, 1929, at 4:00 P.M., in plowed field surrounded by corn and alfalfa.

Crop Contents

1 hind leg of grasshopper, sp?	10 kernels of corn
	39 seeds green foxtail, No. 27
	1 seed yellow foxtail, No. 25
	0.1 cc. conglomerate vegetation

Gizzard Contents

parts of 2 beetles, No. 26.	4 kernels of corn & 6 fragments
	7 seeds green foxtail, No. 27
1 cricket mandible, sp?	4 seeds yellow foxtail, No. 25
19 grasshopper mandibles, sp?	13 seeds giant ragweed, No. 108
	11 seeds little ragweed, No.107
5.3 cc. ground up grasshoppers, sp?	3 seeds wild buckwheat, No.42
	3 seeds wild rose, No. 66
	80 seeds wild tomato, No. 100
	5.4 cc. conglomerate vegetation

322 stones = 2 cc.

BIRD NO. 367 - Female - Adult - from central Lake County. Killed September 18, 1929. Found with broken neck, about 10 feet away from the road, in plowing which had been a barley field this year. Alfalfa and corn fields nearby.

Crop Contents

41 ants (39 queens), No.150
1 caterpillar, No.183
5 field crickets, No.110
2 grasshoppers
1 - No. 98: 1 - No.103
1 katydid, No. 113
0.38 cc. broken up ant wings, & grasshopper and cricket legs, sp ?
10 kernels of corn
7 seeds of flax
594 seeds green foxtail, No. 27
39 seeds yellow foxtail, No.25
8 seeds lady's thumb, No. 45
1 seed little ragweed, No.107
1 unidentified seed
1.3 cc. conglomerate vegetation

Gizzard Contents

11 queen ants, No.150
21 heads & 6 mandibles of ants, sp?
1 beetle, No. 15
2 beetle mandibles, No.17
1 head & 8 mandibles of crickets, sp?
1 grasshopper, No. 103
3 heads & 21 mandibles of grasshoppers, sp?
5 cc. ground up insects, mostly crickets and grasshoppers, sp?
1 kernel of corn & 28 fragments
1 seed of flax
6 seeds barnyard grass, No.16
111 seeds green foxtail, No. 27
19 seeds yellow foxtail, No.25
1 seed of knotweed, No. 46
5 seeds of smartweed, No.44
1 seed wild rose, No. 66
65 seeds wild tomato, No.100
1 unidentified seed
7.4 cc. conglomerate vegetation

155 stones = 0.9 cc.

BIRD NO. 368 - Male - Adult - from central Lake County. Shot September 28, 1929, at 5:30 P.M., in hilly section west of Lake Madison in a sweet clover patch that had been cut by a combine. Corn and natural prairie next to this field.

Crop Contents

1 bug nymph. sp?
1 caterpillar of milkweed
1 butterfly, No. 193
1 tree cricket, No.112
2 grasshoppers, No.103
51 kernels of corn
7 kernels of barley
2 kernels of emmer
143 seeds green foxtail, No. 27
2 seeds small rush grass, No.29
13 seeds wild sunflower, No.114
1.5 cc. conglomerate vegetation

Gizzard Contents

1 ant, No. 146
1 ant head, sp?
2 beetle mandibles, No.17
1 caterpillar mandible, sp?
26 grasshopper mandibles, sp ?
3.5 cc. ground up grasshoppers, sp?
1 kernel of barley
470 seeds green foxtail, No. 27
3 seeds yellow foxtail, No.25
7 seeds of knotweed, No. 46
1 seed wild buckwheat, No.42
2 seeds wild sunflower, No.114
29 seeds wild tomato, No.100
12.5 cc. conglomerate vegetation

164 stones = 1.9 cc.

BIRD NO. 369 - Male Adult - from northwestern Moody County. Shot October 18, 1929, at 8:30 A.M., in a creek bed. Surrounding fields were of corn (being picked by machine), and native grass. Shot from a flock which was coming from the corn field.

Crop Contents

3 grasshoppers, No. 104	1 kernel of corn 9 kernels of barley 32 seeds of flax 3 kernels of oats 6 seeds yellow foxtail, No. 25 0.38 cc.conglomerate vegetation

Gizzard Contents

3 cricket mandibles, sp? 1 grasshopper, No. 104 22 grasshopper mandibles, sp? 0.57 cc. ground up crickets & grasshoppers, sp?	3 kernels of barley 10 seeds bindweed, No. 90 33 seeds yellow foxtail, No. 25 3 seeds sweet clover, No. 74 15 seeds wild rose, No. 66 18 seeds wolfberry, No. 104 13.2 cc.conglomerate vegetation

288 stones = 3 cc.

BIRD NO. 370 - Male - Adult - from north central Lake County. Shot December 21, 1929, at 2:00 P.M., in a corn field, picked by machine. Surrounding fields: corn and a field of sweet clover. Quite a little snow on the ground.

Crop Contents

20 kernels of corn & 1 fragment 0.38 cc.conglomerate vegetation

0.6 cc.dirt

Gizzard Contents

6 fragments of kernels of corn 1 seed green foxtail, No. 27 2 seeds yellow foxtail, No.25 1 grass seed, sp? 1 seed lady's thumb, No. 45 9 seeds wild rose & 10 fragments, No. 66 8.5 cc.conglomerate vegetation

371 stones = 3 cc.

BIRD NO.371 - Male - Adult - from northeastern Lake County. Shot February 18, 1930, at 2:00 P.M., on plowed field which was in oats last season. Adjoining this were areas of prairie land and a field of corn which had been picked by hand.

Crop Contents

	1 kernel of barley
	1 kernel of oats
	15 seeds little ragweed, No.107

Gizzard Contents

6 grasshopper mandibles, sp?	2 kernels of corn
0.2 cc.ground up grasshoppers, sp?	14 kernels of barley
	1 seed green foxtail, No. 27
	66 seeds little ragweed, No.107
	1 seed Russian thistle, No.50
	4 seeds Dakota vetch, No. 70
	186 seeds wild rose, No. 66
	36 seeds wolfberry, No. 104
	10 cc.conglomerate vegetation

50 stones = 1 cc

BIRD NO. 401 - Female - Adult - from northeastern Yankton County. Shot April 3, 1929, at 5:00 P.M., in a stubble field adjoining cut corn and stubble fields of small grain.

Crop Contents

3 beetles: 1 - No. 9	18 kernels of corn
1 - No.17: 1 - No.83	6 kernels of barley
Head & thorax of	5 kernels of oats
beetle, sp?	8 unidentified seeds
1 field cricket leg, No.110	1.5 cc.conglomerate vegetation
25 March-fly larvae, No.165	
2 grasshoppers of last year	
1 - No.103: 1 - No.92	
parts of about 4 grasshoppers of last year	
1 - No.101: 1 -No.106	
2 - No.107	

Gizzard Contents

8 heads & 30 mandibles of beetles, No. 13	4 kernels of corn
0.2 cc.beetle parts, sp?	3 seeds little ragweed, No.107
10 parts cricket legs, No.110	1 seed wild buckwheat, No.42
11 grasshopper mandibles, sp?	13 unidentified seeds
0.12 cc.grasshopper parts of last year, sp?	8 cc.conglomerate vegetation

263 stones = 3.2 cc.

BIRD NO.402 - Male - Adult - from northeastern Turner County. Shot April 9, 1929, at 4:30 P.M., in plowed field, surrounded by plowing, corn, tame grass and alfalfa.

Crop Contents

13 kernels of corn
1.7 cc.conglomerate vegetation (some grass leaves)

Gizzard Contents

4 beetle mandibles, No.13
0.17 cc.ground up insects, sp?

8 kernels of corn
1 seed yellow foxtail, No. 25
1 seed little ragweed, No.107
1 seed Russian thistle,No.50
34 seeds wild buckwheat, No.42
1 seed wild rose, No. 66
1 unidentified seed
8.8 cc.conglomerate vegetation

501 stones = 3.7 cc.

BIRD NO. 403 - Male - Adult - from southeastern Turner County. Shot April 17, 1929, at 5:15 P.M., in stubble field near alfalfa meadow. Corn field across the road.

Crop Contents

None

Gizzard Contents

2 kernels of corn
2 seeds of bindweed, No. 90
21 seeds wild rose, No. 66
2 unidentified seeds
9 cc.conglomerate vegetation

213 stones = 2.2 cc.

BIRD NO. 404 - Male - Adult - from northwestern Turner County. Shot April 26, 1929, at 5:00 P.M., in oat field that was in corn last year. Stubble fields and alfalfa nearby.

Crop Contents

19 kernels of corn
9 kernels of oats
3 sedge spikes with no developed seeds, No. 35
few bits conglomerate vegetation--fraction of 1 cc.

Gizzard Contents

Few bits of beetles,sp?
3 beetle mandibles, sp?

26 fragments of kernels of corn
7 seeds of sedge, No. 35
8.5 cc.conglomerate vegetation

319 stones = 3.8 cc.

BIRD NO. 405 - Female - Adult - from northeastern Turner County. Shot May 2, 1929, at 6:00 P.M., in an alfalfa field, surrounded by stubble fields.

Crop Contents

1 ant, No. 149	5 pieces of grass leaves, sp?

Gizzard Contents

14 ants, sp?	4 seeds yellow foxtail, No.25
2 beetles, No. 13	4 little ragweed, No. 107
2 cutworms, sp?	2 seeds wild rose, No. 66
1 old grasshopper, sp?	3 unidentified seeds
1 cc.ground up insects, sp?	6.75 cc.conglomerate vegetation, some grass leaves

180 stones = 3 cc.

BIRD NO. 406 - Male-Adult-from northeastern Turner County. Shot May 9, 1929, at 5:00 P.M., in an oat field which was in corn last year. Plowed field and alfalfa across the road.

Crop Contents

	53 kernels of corn
	13 kernels of wheat
	1 seed yellow foxtail, No.25
	1 cc. leaves, sp?

Gizzard Contents

	1 kernel of corn & 12 fragments
	1 kernel of barley
	29 seeds yellow foxtail, No. 25
	6 seeds wild rose, No. 66
	13 cc.conglomerate vegetation

131 stones = 3 cc.

BIRD NO. 407 - Male - Adult - from west central Hutchinson County. Shot May 14, 1929, at 5:30 P.M., in the road. Oat fields, which were in corn last year, on both sides of the road.

Crop Contents

2 click beetles	43 kernels of corn
1 - No.62: 1 - No.65	0.7 cc.conglomerate vegetation
1 leg of insect, sp?	

Gizzard Contents

1 snout beetle, No.89	1 kernel of corn & 32 fragments
0.1 cc.ground up beetles, sp?	2 seeds of bindweed, No. 90
	1 seed smartweed, No. 44
	1 seed wild buckwheat, No.42
	11 cc.conglomerate vegetation

390 stones = 3.7 cc.

BIRD NO. 408 - Male - Adult - from central Turner County. Shot May 21, 1929, at 5:15 P.M., in an alfalfa field. Oat field on opposite side of road.

Crop Contents

2 kernels of oats.

Gizzard Contents

3 beetle mandibles, No.17
1 caterpillar mandible, sp?
0.13 cc. ground up beetles, sp?
30 fragments of kernels of corn
1 seed green foxtail, No. 27
11.5 cc. conglomerate vegetation
280 stones = 3.8 cc.

BIRD NO. 409 - Male - Adult - from northeastern Hutchinson County. Shot May 29, 1929, at 5:45 P.M., in oat field that was in corn last year. Oat fields on opposite side of road.

Crop Contents.

1 beetle, No. 83
1 cutworm, sp?
17 kernels of corn
20 kernels of wheat
0.4 cc. conglomerate vegetation

Gizzard Contents

1 ant, No. 149
26 heads & 7 mandibles of ants, sp?
0.1 cc. ground up ants, sp?
2 beetle mandibles, sp?
8 cutworm mandibles, sp?
1 kernel of corn & 14 fragments
2 kernels of wheat
3 seeds wild rose, No. 66
9.5 cc. conglomerate vegetation
271 stones = 2.4 cc.

BIRD NO. 410 - Male - Adult - from east central Hutchinson County. Shot June 5, 1929, at 6:15 P.M., in an oat field that was in corn last year. Alfalfa field adjoining oats. Corn (about 2 inches high) across the road.

Crop Contents

1 spider, No. 188
7 seed pods, cut-leaved crane's bill containing 2 seeds, No. 80

Gizzard Contents

4 ant heads, sp?
1 head, snout beetle, No. 89
3 beetles
2 - No. 45. 1 - No. 79
6 beetle mandibles
2 - No. 13: 2 - No. 31.
2 - sp?
0.25 cc. ground up beetles, sp?
4 cutworms, sp?
2 flies, sp?
1 kernel of barley
744 seeds two-leaved Solomon's seal, No. 38
1 seed wild buckwheat, No. 42
9 wild rose blossom buds & 4 fragments of seeds, No. 66
11.2 cc. conglomerate vegetation
465 stones = 4.2 cc.

BIRD NO. 411 - Male - Adult - from west central Hutchinson County. Shot June 10, 1929, at 5:45 P.M., in a corn field in which the corn was about 2 inches high. Corn fields on both sides of the road.

Crop Contents

1 ant, No. 149
1 snout beetle, No. 89
1 click beetle, No. 64
3 leaf beetles
2 - No. 43: 1 - No.45
1 leaf beetle grub, No.45
19 bits, beetle bodies, sp?
2 cutworms, sp?
2 spiders, No.188
21 kernels of corn (18 definitely unsprouted and 3 questionably so)
1 seed two-leaved Solomon's seal, No. 38
0.1 cc. conglomerate vegetation

Gizzard Contents

1 ant, No. 149
18 ant mandibles, sp?
2 snout beetles, No.89
12 heads, snout beetles, No.89
1 leaf beetle, No. 43
12 beetle mandibles,
8 - No.13: 1 - No.19
3 - sp?
12 cutworm mandibles, sp?
2 grasshopper mandibles, sp?
1 spider, No. 188
1.5 cc. ground up insects, mostly beetles, sp?
1 kernel of corn
1 seed green foxtail, No. 27
1 seed yellow foxtail, No.25
590 seeds two-leaved Solomon's seal, No. 38
3.4 cc. conglomerate vegetation

97 stones - .7 cc..

BIRD NO. 412 - Female - Adult - from central Turner County. Shot June 15, 1929, at 6:15 P.M., in wild grass meadow, adjoining corn fields. Bird came out of corn field and went into meadow.

Crop Contents

1 ant, sp?
5 snout beetles, No.89
44 beetles
1 - No. 4: 29 - No.51
5 - No.52: 5 - No.40
2 - No.48: 1 - No.49
1 - No.28
29 leaf beetle grubs
21 - No.55: 1 - No.50
3 - No.36: 4 - No.39
206 seed pods of blue-eyed grass containing 3193 seeds, No.40
8 composite buds
86 seeds of rush, No. 36
70 seeds of violet , No. 85
1 seed wood sorrel, No. 79
3 unidentified seeds
0.25 cc. conglomerate vegetation

(BIRD NO. 412 continued on next page)

(BIRD NO. 412 - continued)

5 click beetles, No. 67
2 beetle heads, sp?
1 Braconid, No. 143
7 bugs: 2 - No. 140:
1 - sp?; 1 - No.142:
2 - No.128; 1 - No. 133
2 bug heads, sp?
5 caterpillars
3 - No. 184: 2 - No.179
1 cutworm sp?
1 fly, No. 174
1 grasshopper nymph, No.107
1 moth, sp?
2 sawfly grubs, No. 161
5 spiders, No. 188
0.1 cc. insect parts, sp?

Gizzard Contents

3 heads & 2 mandibles of ants, No. 149
1 snout beetle, No.89
7 beetles
1 - No. 80: 4 - No.51
1 - No. 52: 1 - No.4
1 beetle grub, No. 55
1 click beetle, No. 67
16 beetle heads, sp?
7 beetle mandibles
4 - sp? 3 - No. 17
3 bugs, No. 141
1 caterpillar, No.184
1 cutworm, sp?
1 Hymenopteron, No.159
1 spider, No. 188
.4 cc. ground up insects, mostly beetles, sp?

33 seed pods, blue-eyed grass containing 340 seeds, No.40
786 seeds, blue-eyed grass, No.40
3 seeds yellow foxtail, No. 25
23 seeds panic grass, No. 22
144 rush pods containing 31,824 seeds, No. 36
27 seeds of sedge, No. 35
3 seeds of smartweed, No. 44
3 seeds sweet clover, No. 74
1 seed milk vetch, No. 68
40 seeds of violet, No. 85
9 seeds of wood sorrel, No.79
12 cc. conglomerate vegetation

193 stones = 3.4 cc.

BIRD NO. 413 - Male - Adult - from central Turner County. Shot June 21, 1929, at 6:30 P.M., in an oat field. Corn across the road.

Crop Contents

3 ants
  2 - No. 147
  1 - No. 157
3 click beetles, No. 67
2 leaf beetles, No. 45
1 bug. No. 128

53 kernels of corn
1 cc.conglomerate vegetation

Gizzard Contents

2 heads & 6 mandibles of ants, sp?
30 heads of snout beetles, No. 89
2 beetle heads, sp?
15 beetle mandibles
  10 - No. 17
  4 - sp?
  1 - No. 87
1.8 cc.ground up beetles, mostly No. 89
1 cutworm mandible, sp?

7 kernels of corn & 32 fragments
1 seed yellow foxtail, No. 25
12 seeds of puccoon, No. 93
2 seeds of smartweed, No. 44
2 seeds wild buckwheat, No.42
1 seed wild rose, No. 66
14.7 cc.conglomerate vegetation

137 stones = 3 cc.

BIRD NO. 414 - Male - Adult - from Turner County. Shot June 30, 1929, at 7:00 P.M., in the edge of an oat field. Corn across the road.

Crop Contents

4 kernels of corn & 4 fragments

Gizzard Contents

1 ant head, sp?
0.38 cc. ground up beetles, sp?
4 cricket mandibles, sp?
2 grasshopper mandibles, sp?

38 fragments of kernels of corn
6.2 cc.conglomerate vegetation

178 stones = 3.2 cc.

BIRD NO. 415 - Male - Adult - from north central Turner County. Shot July 5, 1929, at 6:30 P.M., near an alfalfa field. Oat field on opposite side of road.

Crop Contents

2 beetles 1 - No.59: 1 - No.32	2 kernels of barley 714 kernels of oats
2 beetle grubs, No. 27	13 seed pods of asparagus containing 12 seeds, No. 37
12 bugs: 8 - No. 128: 1 - sp? 1 - No.129 1 -No.136: 1 - No.141	67 seeds of bramble, No. 67 52 seeds of cinquefoil, No. 61
2 cabbage butterflies, No. 195	7 flower buds, sp? 34 seeds panic grass, No. 22
1 snipe fly, No. 171	33 seeds of violet, No. 85
1 Ichneumon fly, No.153	8.5 cc.conglomerate vegetation
8 lace-wing flies 2 - No.186: 6- No.187	
2 lantern-fly nymphs, No.121	
3 spiders, No. 188	
2 tree hoppers. 1 - No.125: 1 - No.127	

Gizzard Contents

2 heads of snout beetles, No. 89	12 kernels of oats
0.6 cc.ground up insects, chiefly beetles, sp?	138 seeds of bramble, No. 67 24 seeds panic grass, No. 22 190 seeds of violet, No. 85 1 unidentified seed 33.5 cc. oat hulls

192 stones = 4.7 cc.

BIRD NO. 416 - Female - Adult - from northwestern Turner County. Shot July 11, 1929, at 5:30 P.M., on alfalfa and sweet clover land, adjoining native grass pasture.

Crop Contents

	31 kernels of oats 120 seeds wood sorrel, No. 79 2 cc.conglomerate vegetation

Gizzard Contents

9 ant heads, No. 146	1 seed of bindweed, No. 90
1 beetle mandible, sp?	1 seed sweet clover, No. 74
0.2 cc.ground up insects, mostly beetles, sp?	24 seeds wild buckwheat, No. 42 1 seed wild rose, No. 66 44 seeds wood sorrel, No. 79 1 unidentified seed 19.8 cc.conglomerate vegetation, some oat hulls

399 stones = 6.1 cc.

BIRD NO.416 - Female - Adult - from northwestern Turner County. Shot July 11, 1929, at 5:30 P.M., on alfalfa and sweet clover land, adjoining native grass pasture.

Crop Contents

31 kernels of oats
120 seeds wood sorrel, No. 79
2 cc.conglomerate vegetation

Gizzard Contents

9 ant heads, No. 146
1 beetle mandible, sp?
0.2 cc.ground up insects, mostly beetles, sp?
1 seed of bindweed, No. 90
1 seed sweet clover, No.74
24 seeds wild buckwheat, No.42
1 seed wild rose, No. 66
44 seeds wood sorrel, No.79
1 unidentified seed
19.8 cc.conglomerate vegetation, some oat hulls

399 stones = 6.1 cc.

BIRD NO. 417 - Male - Adult - from northeastern Hutchinson County. Shot July 17, 1929, at 6:15 P.M., in alfalfa field surrounded by oat fields.

Crop Contents

None

Gizzard Contents

11 ant heads, sp?
1 caterpillar mandible, sp?
21 cricket mandibles, sp?
0.14 cc.ground up crickets, sp?
2 cutworms, sp?
1 grasshopper mandible, sp?
2 kernels of barley
1 seed Russian thistle, No. 50
4 seeds two-leaved Solomon's seal, No. 38
1 seed wild buckwheat, No.42
30 cc.conglomerate vegetation

318 stones = 4.2 cc.

BIRD NO. 418 - Male - Adult - from north central Turner County. Shot July 15, 1929, at 7:00 P.M., in an alfalfa field surrounded by corn and wild pasture.

Crop Contents

333 kernels of barley
1.4 cc.conglomerate vegetation

Gizzard Contents

1 ant mandible, sp?
1 beetle mandible, No.17
0.1 cc.ground up beetles, sp?
1 grasshopper mandible, sp?
1 tree cricket, No.113
77 kernels of barley
12.7 cc.barley hulls
1 seed wild rose, No.66

304 stones = 2.9 cc.

BIRD NO. 419 - Female - Adult - from southwestern Clay County. Shot July 26, 1929, at 6:15 P.M., in a sweet clover patch, surrounded by corn and wheat.

Crop Contents

4 army worms, No.192	10 kernels of corn & 9 fragments
2 grasshoppers, No.107	1 kernel of barley
	591 seeds of violet, No. 85
	66 unidentified seeds
	0.8 cc.blossoms

Gizzard Contents

1 ant, No. 149	2 kernels of corn & 9 fragments.
1 head, snout beetle, No.89	1 kernel of wheat
4 beetles, No. 44	1 seed barnyard grass, No. 16
2 beetle mandibles, No.17	2 choke cherry pits, No. 64
2 cricket mandibles, sp?	414 seeds green foxtail, No. 27
1 cutworm, sp?	6 seeds of grape, No. 84
1 head & 4 mandibles of cutworms, sp?	18 seeds of nightshade, No.101
	1 seed of sedge, No. 35
3 grasshoppers, No.107	1 seed sweet clover, No. 74
5 grasshopper mandibles, sp?	510 seeds of violet, No. 85
	1 seed wild rose, No. 66
1 tree-hopper, No. 125	8.5 cc.conglomerate vegetation
1.7 cc.ground up beetles and grasshoppers, sp?	

126 stones = 1.3 cc.

BIRD NO. 420 - Male - Adult - from central Turner County. Shot July 30, 1929, at 6:00 P.M., in an alfalfa field adjoining corn and oats.

Crop Contents

	70 kernels of barley
	428 kernels of oats
	15.5 cc. oat chaff
	9 kernels of wheat

Gizzard Contents

0.02 cc. ground up beetle parts, sp?	45 kernels of barley
	28 kernels of oats
	16 cc.conglomerate vegetation

310 stones 4.3 cc.

BIRD NO. 421 - Male - Adult - from east central Turner County. Shot August 5, 1929, at 6:30 P.M., in oat stubble adjoining corn and oats.

Crop Contents

None

Gizzard Contents

0.07 cc.ground up insects, probably Hymenoptera, sp?	115 seeds green foxtail, No.27 147 seeds yellow foxtail, No.25 5.5 cc. foxtail hulls 222 seeds of nightshade, No.101

227 stones = 2.8 cc.

BIRD NO. 422 - Female - Adult - from central Turner County. Shot August 10, 1929, at 7:00 P.M., in oat stubble next to a corn field.

Crop Contents

8 seeds green foxtail, No. 27 2 seeds yellow foxtail, No.25

Gizzard Contents

2 beetle mandibles, No.17 2 caterpillar mandibles, sp? 14 grasshopper mandibles, sp? 1.7 cc.ground up grasshoppers, sp?	188 seeds green foxtail, No. 27 96 seeds yellow foxtail, No. 25 7 seeds of millet 2 seeds of puccoon, No. 93 2 seeds wild buckwheat, No. 42 7.5 cc.conglomerate vegetation

417 stones = 3.8 cc.

BIRD NO. 423 - Male - Adult - from central Turner County. Shot August 15, 1929, at 7:00 P.M., in a stubble field next to fields of alfalfa and corn.

Cro pContents

42 kernels of barley 13 kernels of oats

Gizzard Contents

5 beetle mandibles 4 - sp? 1 - No.86 1 caterpillar mandible, sp? 2 heads & 2 mandibles of grasshoppers, sp? 1 Hymenopteron head, sp? 1.5 cc.ground up beetles & grasshoppers, sp?	14 kernels of barley 3 kernels of oats 3 seeds green foxtail, No. 27 113 seeds yellow foxtail, No. 25 10.5 cc.conglomerate vegetation

249 stones = 5.6 cc.

BIRD NO. 424 - Male - Adult - from southwestern McCook County. Shot August 19, 1929, at 6:15 P.M., in road. Alfalfa field on one side, barley stubble on the other.

Crop Contents

175 kernels of barley
0.2 cc.conglomerate vegetation

Gizzard Contents

31 beetle mandibles, No.17
2 Ambush bugs, No. 138
7 caterpillars
5 - No.196: 1 -No.183
1 - No.197
1 caterpillar mandible, sp?
2 cricket mandibles, sp?
5 grasshopper mandibles, sp?
2 spiders, No. 188
0.38 cc.ground up beetles and grasshoppers, sp?
87 kernels of barley
32 seeds of crabgrass, No.14
12 seeds green foxtail, No. 27
49 seeds yellow foxtail, No. 25
1 seed ground cherry, No. 97
6 seeds wood sorrel, No. 79
12.6 cc.conglomerate vegetation

562 stones = 7 cc.

BIRD NO. 425 - Male - Adult - from central Turner County. Shot August 24, 1929, at 7:00 P.M., in an alfalfa field adjoining corn fields.

Crop Contents

1 bug, No. 132
23 kernels of corn
1.7 cc. corn seed coats
150 seeds green foxtail, No. 27
70 seeds yellow foxtail, No. 25

Gizzard Contents

2 cricket mandibles, sp?
10 grasshopper mandibles, sp?
1.6 cc.ground up grasshoppers, sp?
8 fragments of kernels of corn
1 composite blossom, sp?
423 seeds green foxtail, No. 27
115 seeds yellow foxtail, No.25
2 seeds Dakota vetch, No. 70
1 seed wild buckwheat, No. 42
10 cc.conglomerate vegetation

309 stones = 3.6 cc.

BIRD NO. 426 - Male - Adult - from west central Turner County. Shot August 31, 1929, at 7:00 P.M., in a stubble field. Alfalfa across the road.

Crop Contents

5 butterfly caterpillars, No. 194	11 kernels of corn
1 leg of field cricket, No. 110	53 kernels of oats
	44 seeds green foxtail, No. 27
	51 seeds yellow foxtail, No.25
	4 seeds little ragweed, No.107
	0.05 cc.conglomerate vegetation

3 small stones

Gizzard Contents

1 ant head, sp?	10 kernels of oats
1 beetle mandible,No.17	1 seed barnyard grass,No. 16
2 caterpillars	185 seeds green foxtail, No.27
1 -No.194: 1 -No.197	59 seeds yellow foxtail,No.25
2 field crickets,No.110	30 seeds little ragweed, No.107
3 heads & 38 mandibles of crickets, sp?	8.3 cc.conglomerate vegetation
1 head & 11 mandibles of grasshoppers, sp?	
5 cc.ground up crickets & grasshoppers,sp?	

197 stones = 2.8 cc.

BIRD NO. 427- Male - Adult - from east central Turner County. Shot September 14, 1929, at 9:00 A.M., in stubble field. Stubble on both sides of the road.

Crop Contents

4 field crickets,No.110	6 kernels of corn
	1 seed yellow foxtail,No. 25
	0.11 cc.conglomerate vegetation

Gizzard Contents

36 heads & 3 mandibles of ants, sp?	2 kernels of corn & 16 fragments
7 beetle mandibles	1 kernel of barley
6 - No. 17	1 kernel of wheat
1 - No. 31	1 seed of alfalfa
1 caterpillar, No.175	1 seed of bindweed, No. 90
58 cricket mandibles,sp?	4 seeds of crab grass, No.14
0.25 cc.ground up crickets and ants, sp?	201 seeds yellow foxtail, No.25
	3 seeds of smartweed, No. 44
	4 seeds of sumach, No. 83
	12 cc.conglomerate vegetation

161 stones = 2.5 cc.

BIRD NO.428 - Male - Adult - from north central Turner County. Shot September 23, 1929, at 8:30 A.M., in stubble field. Corn and alfalfa on other side of road.

Crop Contents

	5 seeds green foxtail, No. 27 1 seed yellow foxtail, No. 25

Gizzard Contents

155 cricket mandibles, sp? 23 grasshopper mandibles, sp? 1.5 cc. ground up crickets & grasshoppers, mostly grasshoppers, sp?	13 kernels of barley 163 seeds green foxtail, No. 27 136 seeds yellow foxtail, No. 25 7 seeds of smartweed, No. 44 2 seeds wild buckwheat, No. 42 8 cc. conglomerate vegetation

60 stones = 1.5 cc.

BIRD NO.429 - Male - Adult - from east central Turner County. Shot October 6, 1929, at 4:00 P.M., at the side of the road by a stubble field. Corn fields across the road and adjoining stubble.

Crop Contents

	17 kernels of oats 0.17 cc. conglomerate vegetation

Gizzard Contents

1 beetle mandible, No. 17 1 cricket mandible, sp? 7 grasshopper mandibles, sp? 0.2 cc. ground up beetles & grasshoppers, sp?	20 kernels of oats 3 seeds of bindweed, No. 90 2 seeds green foxtail, No. 27 72 seeds yellow foxtail, No. 25 1 seed little ragweed, No. 107 3 seeds of sedge, No. 35 5 seeds of smartweed, No. 44 18 seeds wild grape, No. 84 3 seeds wild rose, No. 66 16 cc. conglomerate vegetation

137 stones = 3.5 cc.

BIRD NO.430 - Male - Adult - from northwestern Turner County. Shot October 25, 1929, at 3:00 P.M., in a weed patch beside a ditch. Stubble fields all around.

Crop Contents

None

Gizzard Contents

1 ant, No. 149 5 cricket mandibles, sp? 2 grasshoppers 1 - No. 93; 1 - No. 103 23 grasshopper mandibles, sp? 1 snail, No. 190 0.08 cc. ground up insects, some crickets, sp?	3 seeds giant ragweed, No. 108 1 seed of sedge, No. 35 10 seeds smartweed, No. 44 2 seeds wild rose, No. 66 145 seeds wild tomato, No. 100 9 seeds wolfberry, No. 104 5 cc. conglomerate vegetation

175 stones = 2 cc.

BIRD NO.431 - Female - Adult - from north central Turner County. Shot November 12, 1929, at 4:00 P.M., in a corn field. Plowed field on opposite side of road.

Crop Contents

1 ant, No. 149	25 kernels of corn
6 beetle grubs, No.17	26 seeds field bindweed, No.89
1 ground beetle, No.24	296 seeds green foxtail, No. 27
1 ladybird beetle, No.61	34 seeds yellow foxtail, No.25
1 rove beetle, No. 82	1 seed wild rose, No.66
1 bug, No.131	0.7 cc.conglomerate vegetation
1 cutworm, sp?	
1 grasshopper, No.103	

Gizzard Contents

1 ant head, sp?	2 kernels of corn
1 head, 4 mandibles of beetles, sp?	24 seeds of bindweed, No. 90
1 field cricket, No.110	98 seeds green foxtail, No. 27
3 cricket mandibles, sp?	16 seeds yellow foxtail, No.25
13 grasshopper mandibles, sp?	2 seeds ground cherry, No.97
0.38 cc.ground up crickets & grasshoppers, sp?	19 seeds lady's thumb, No.45
	3 seeds milkweed, No. 88
	1 seed prairie plantain, No.102
	33 seeds wild rose, No.66
	2 unidentified seeds
	9.3 cc.conglomerate vegetation

286 stones = 3 cc.

BIRD NO.432 - Male - Adult - from central Turner County. Shot November 30, 1929, at 4:30 P.M., in a corn field bordered by a pasture.

Crop Contents

	1 kernel of barley
	28 kernels of oats
	0.5 cc.oat chaff

Gizzard Contents

1 leg & body bits of beetle, sp?	1 seed wild buckwheat, No.42
	10.4 cc.conglomerate vegetation

459 stones = 4.4 cc.

BIRD NO.433 - Male - Adult - from northwestern Turner County. Shot December 19, 1929, at 4:00 P.M., in a stubble field, next to a corn field.

Crop Contents

None

Gizzard Contents

	38 seeds field bindweed, No.89
	3 seeds sweet clover, No. 74
	24 seeds wild rose, No. 66
	7.5 cc.conglomerate vegetation

370 stones = 4.3 cc.

BIRD NO.434 - Male - Adult - from northwestern Turner County. Shot December 27, 1929, at 4:00 P.M., in stubble field near a corn field. Alfalfa across the road.

Crop Contents

2 grasshoppers, No.103	13 kernels of corn
2 grasshopper heads, sp?	2 kernels of wheat
0.57 cc.parts of grasshoppers, sp?	3 seeds small rush grass, No.29
	1.5 cc.corglomerate vegetation, some alfalfa leaves

Gizzard Contents

2 grasshoppers, No.103	2 cc.alfalfa leaves
1 head & 42 mandibles of grasshoppers, sp?	2 seeds of bindweed, No. 90
4 cc.ground up grasshoppers, sp?	6 seeds yellow foxtail, No. 25
	9 seeds little ragweed, No. 107
	6 seeds Dakota vetch, No. 70
	63 seeds wild rose, No. 66
	15 seeds wild sunflower, No.114
	8.5 cc.conglomerate vegetation

375 stones = 4 cc.

BIRD NO.435 - Male - Adult - from northwestern Turner County. Shot January 20, 1930, at 3:00 P.M., in field of corn stalks, surrounded by stubble fields.

Crop Contents

18 kernels of corn
2 kernels of oats
30 seeds field bindweed, No. 89
1 seed green foxtail, No. 27
1 seed yellow foxtail, No. 25
53 seeds little ragweed, No.107
26 seeds wild sunflower, No.114
4 cc.conglomerate vegetation

Gizzard Contents

2 kernels of corn & 1 fragment
2 kernels of oats
4 kernels of wheat
25 seeds of bindweed, No. 90
2 seeds little ragweed, No.107
118 seeds wild rose, No. 66
4 seeds wild sunflower, No.114
12 cc.conglomerate vegetation

204 stones = 2.8 cc.

BIRD NO.436 - Male - Adult - from southeastern Hutchinson County. Shot February 2, 1930, at 4:00 P.M., in a stubble field near a bunch of willows. Pasture adjoining the stubble.

Crop Contents

None

Gizzard Contents

2 cricket mandibles, sp?	1 seed of bindweed, No. 90
12 grasshopper mandibles, sp?	3 seeds little ragweed, No.107
0.07 cc.ground up grasshoppers, sp?	1 seed wild rose, No. 66
	1 unidentified seed
	2 cc.conglomerate vegetation

246 stones = 4.1 cc.

BIRD NO. 437 - Male - Adult - from southeastern Hutchinson County. Shot February 10, 1930, at 4:30 P.M., in a brush patch near a corn field. Stubble field nearby.

Crop Contents

	8 kernels of corn
	4 kernels of oats
	1 seed of blue-stem, No. 7

Gizzard Contents

0.1 cc.ground up beetles, sp?	2 kernels of corn & 7 fragments
	1 kernel of oat
	2 seeds of bindweed, No. 90
	2 seeds yellow foxtail, No.25
	1 sandcherry pit, No. 63
	7 seeds of smartweed, No. 44
	1 seed sweet clover, No. 74
	50 seeds wild rose and 12 fragments, No. 66
	11.3 cc.corglomerate vegetation

110 stones = 2.2 cc.

BIRD NO.438 - Male - Adult - from east central Hutchinson County. Shot February 19, 1930, at 3:00 P.M., in stubble field adjoining corn fields.

Crop Contents

1 beetle wing, sp?	396 kernels of wheat
1 cutworm, sp?	2 seeds of alfalfa
1 leg of grasshopper, sp?	2 seeds barnyard grass, No.16
	14 seeds beggar ticks, No.111
	33 seeds of foxtail, No. 28
	62 seeds green foxtail, No. 27
	24 seeds yellow foxtail, No.25
	1 grass seed, sp?
	2 seeds lamb's quarters, No. 49
	2 seeds milky spurge, No. 81
	1 seed old-witch grass, No. 19
	218 seeds little ragweed, No.107
	3 seeds rough pigweed, No. 52
	717 seeds wild buckwheat, No.42
	575 seeds wood sorrel, No. 79
	6.5 cc.conglomerate vegetation

Gizzard Contents

6 grasshopper mandibles, sp?	32 kernels of wheat
0.2 cc.ground up grasshoppers, sp?	1 seed barnyard grass, No. 16
	10 seeds of bindweed, No. 90
	50 seeds green foxtail, No. 27
	17 seeds yellow foxtail, No.25
	28 seeds little ragweed, No.107
	6 seeds smartweed, No. 44
	14 seeds of vervain, No. 94
	277 seeds wild buckwheat, No. 42
	23 seeds wood sorrel, No. 79
	8.5 cc.conglomerate vegetation

45 stones = 0.6 cc.

BIRD NO.439 - Male - Adult - from southeastern Hutchinson County. Shot March 6, 1930, at 5:00 P.M., in a stubble field adjoinging corn field and pasture.

Crop Contents

None

Gizzard Contents

1 fly puparium, sp?	1 seed green foxtail, No. 27
few bits of broken up grasshoppers, sp?	5 seeds of smartweed, No. 44
	1 seed two-leaved Solomon's seal, No. 38
	7 seeds wild buckwheat, No. 42
	1 seed wild rose, No. 66
	7 cc.conglomerate vegetation

282 stones = 3.3 cc.

BIRD NO.440 - Male - Adult - from southeastern Hutchinson County. Shot March 29, 1930, at 5:30 P.M., in a meadow next to a corn field.

Crop Contents

1 grasshopper, No.107	6 kernels of corn & 2 fragments 4 kernels of barley 6 kernels of oats 41 kernels of wheat 0.25 cc.grass leaves, sp? 0.5 cc. conglomerate vegetation

Gizzard Contents

2 beetle mandibles, No.13 4 grasshopper mandibles, sp? 0.33 cc.ground up beetles & grasshoppers, sp? 0.04 cc.broken up bits of snail shell, No.190	1 kernel of corn & 15 fragments 1 kernel of barley 1 kernel of oat 30 kernels of wheat 1 seed green foxtail, No. 27 5 seeds yellow foxtail, No.25 2 seeds smartweed, No.44 2 seeds wild buckwheat, No.42 9 seeds wild rose, & 15 fragments, No. 66 10.5 cc.conglomerate vegetation

305 stones = 4.5 cc.

BIRD NO.451 - Male - Adult - from south central Sanborn County. Shot April 2, 1929, at 6:10 P.M., in stubble field, about 10 rods from disced corn field not yet seeded. Native grass pasture, corn field and alfalfa nearby.

Crop Contents

None

Gizzard Contents

0.17 cc.beetle parts,sp? 1 grasshopper leg, sp?	4 kernels of oats 5 seeds green foxtail, No. 27 16 seeds yellow foxtail, No.25 2 seeds of knotweed, No. 46 4 seeds lamb's quarters, No.49 2 seeds little ragweed, No.107 2 seeds rough pigweed, No. 52 2 seeds Russian thistle, No.50 1 seed Dakota vetch, No. 70 2 seeds wild buckwheat, No.42 7 unidentified seeds 9 cc.conglomerate vegetation

101 stones = 3 cc.

BIRD NO.452 - Male - Adult - from east central Davison County, Shot April 11, 1929, at 7:05 P.M., in road ditch next to stubble; some snow on ground. Adjoining areas were of sweet clover, disced corn, and trees.

Crop Contents

1 grasshopper of last year, No. 103	146 kernels of barley
parts of 1 grasshopper of last year, No.107	258 kernels of oats
	17 kernels of wheat
	48 seeds of green foxtail, No.27
	1532 seeds yellow foxtail, No.25
	2 seeds lamb's quarters, No.49
	5 seeds Russian thistle, No.50
	75 seeds sweet clover, No. 74
	16 seeds wild buckwheat, No.42
	4.5 cc.conglomerate vegetation

2260 stones = 0.72 cc.

Gizzard Contents

18 beetle mandibles, No.13	5 kernels of barley
0.06 cc.broken up beetles, sp?	3 kernels of oats
	15 cc.oat hulls
	2 seeds green foxtail, No. 27
	94 seeds yellow foxtail, No.25
	23 seeds sweet clover, No. 74
	1 seed wild buckwheat, No. 42
	9 seeds wild rose, No. 66

1886 stones = 4 cc.

BIRD NO.453 - Male - Adult - from east central Davison County. Shot April 18, 1929, at 6:35 P.M., in stubble field adjoining sweet clover, disced corn and spring plowing. Alfalfa across the road.

Crop Contents

2 ants, No. 146	400 kernels of wheat
1 beetle, No. 20	8.5 cc.wheat chaff
wing & thorax of beetle, No. 17	5 seeds green foxtail, No. 27
2 cutworms, sp?	16 seeds wild buckwheat, No.42
parts of Ichneumon fly, No. 153	

587 stones = 0.03 cc.

Gizzard Contents

2 beetle grubs 1 - No.13: 1 - sp?	21 kernels of wheat
1 beetle head, sp?	15.3 cc.wheat chaff & bran
10 beetle mandibles, No.13	41 seeds green foxtail, No. 27
1 cutworm, sp?	1 seed yellow foxtail, No. 25
0.2 cc.ground up insects, sp?	31 seeds wild buckwheat, No.42

874 stones = 3.4 cc.

BIRD NO.454 - Female - Adult - from east central Aurora County. Shot April 26, 1929, at 7:25 P.M., in stubble field, surrounded by plowing, pasture and burnt-over stubble.

Crop Contents

1 grasshopper, No. 94	3 kernels of corn & 1 fragment 44 kernels of wheat 0.25 cc. conglomerate vegetation

Gizzard Contents

19 ant heads, sp? 8 beetle mandibles 7 - No. 17; 1 - sp? 1 grasshopper, No. 94 11 grasshopper mandibles, sp? 0.25 cc. ground up ants, beetles & grasshoppers, sp?	45 kernels of wheat 6 seeds yellow foxtail, No. 25 4 seeds wild rose, No. 66 1 unidentified seed 13 cc. conglomerate vegetation

375 stones = 3.7 cc.

BIRD NO.455 - Male - Adult - from north central Hanson County. Shot May 3, 1929, at 6:35 P.M., in spring wheat field; grain two inches high. Adjoining fields were of stubble, native pasture and plowing. Crop Contents - None

Gizzard Contents

6 beetles, No. 77 1 cc. ground up beetles and ants, sp?	30 kernels of wheat 1 seed yellow foxtail, No. 25 2 seeds Dakota vetch, No. 70 2 seeds wild rose, No. 66 7.9 cc. conglomerate vegetation

268 stones = 3.4 cc.

BIRD NO.456 - Male - Adult - from north central Davison County. Shot May 10, 1929, at 7:15 P.M., in corn field that had been fed down. Stubble, sweet clover and native pasture were adjoining fields.

Crop Contents

1 caterpillar, sp? 1 cutworm, sp?	65 kernels of corn 5 kernels of oats 0.06 cc. grass leaves, sp?

Gizzard Contents

several ant mandibles, sp? 15 beetle mandibles, No. 13 0.43 cc. ground up insects, mostly No. 13	7 kernels of corn & 1.5 cc. fragments 8 cc. conglomerate vegetation

202 stones = 3.5 cc.

BIRD NO.457 - Male - Adult - from northeastern Davison County. Shot May 17, 1929, at 7:45 P.M., in corn field which was being planted at the time. Native grass pasture, spring wheat and oats surrounded the corn field.

Crop Contents

6 snout beetles, No. 89	76 kernels of corn 1 kernel of barley 2 kernels of oats 47 kernels of wheat 0.14 cc.conglomerate vegetation

Gizzard Contents

35 ants, No. 152 31 ant heads, sp? 2 snout beetles,No. 89 1 beetle, No. 79 4 heads & 3 mandibles of beetles, No.17 2 cricket mandibles,sp? 1.2 cc.ground up ants and beetles, sp?	1 kernel of corn & 38 fragments 1 seed little ragweed, No.107 1 seed of sedge, No. 35 22 seeds wild grape, No. 84 55 seeds wild rose, No. 66 11.5 cc.conglomerate vegetation

84 stones = 1.6 cc.

BIRD NO.458 - Male - Adult - from central Davison County. Shot May 24, 1929, at 7:20 P.M., on native grass pasture, surrounded by corn (2 inches high), alfalfa, and oats (4 inches high).

Crop Contents

	24 kernels of corn, unsprouted

Gizzard Contents

6 beetle mandibles 1 - sp? 5 - No. 17 0.38 cc.ground up beetles, sp? 1 cutworm mandible, sp?	42 fragments of kernels of corn 7.6 cc.conglomerate vegetation

240 stones = 3.8 cc.

BIRD NO.459 - Female - Adult - from north central Davison County. Shot May 31, 1929, at 7:40 P.M., in oat field (grain 5 inches high) which was in corn last year. Surrounding areas were: spring wheat, corn, alfalfa, and a grove of trees. Bird at first was feeding in the corn (which was about 3 inches high) and then worked over into the oats.

Crop Contents

2 beetles, sp?
5 cutworms, sp?
19 kernels of corn (14 definitely unsprouted, 5 questionable)
0.4 cc. conglomerate vegetation

Gizzard Contents

14 ant heads, sp?
24 beetle mandibles: 2-sp?
21 - No.13: 1 - No.19
head & thorax of click beetle, sp?
3 cutworms, sp?
36 cutworm mandibles, sp?
1 Ichneumon fly, No.154
0.5 cc. ground up insects, mostly beetles, sp?
1 kernel of corn & 60 fragments
8 seeds, possibly two-leaved Solomon's seal, No. 38
1 unidentified seed
9.5 cc. conglomerate vegetation

367 stones = 3.1 cc.

BIRD NO.460 - Male - Adult - from north central Davison County. Shot June 7, 1929, at 7:50 P.M., on grassy section line. Corn, 4 inches high, on one side; oats, 6 inches high, on the other side. Bird moved from oats into corn and back into grass.

Crop Contents

1 ant head, sp?
1 beetle, No. 45
bits of 1 beetle, No.13
abdomen of beetle, No.2
2 spiders, No. 188
parts of 1 spider, No. 188
12 unsprouted kernels of corn and 21 fragments
12 kernels of barley
1 kernel of oat
385 seeds of dandelion, No.117
3.75 cc. poppus from dandelion seed, No. 117
8 seeds green foxtail, No. 27
40 seeds proso millet, No. 20
1 seed switch grass, No. 21

Gizzard Contents

12 heads, snout beetle, No.89
1 beetle head, sp?
13 beetle mandibles
1 - No.31: 11-No.17
1 - sp?
1.3 cc. ground up beetles, mostly No. 89
2 caterpillar mandibles, sp?
2 grasshopper mandibles, sp?
4 fragments of kernels of corn
2 kernels of barley
62 seeds of dandelion, No.117
2 seeds green foxtail, No. 27
2 seeds panic grass, No. 22
2 seeds Dakota vetch, No. 70
4 seeds wild rose, No. 66
10 cc. conglomerate vegetation

323 stones = 4.2 cc.

BIRD NO.461 - Male - Adult - from northwestern Davison County. Shot June 18, 1929, at 7:10 P.M., in a corn field (corn about 4 inches high) that was just cultivated. The surrounding fields were of corn, oats and native grass pasture with drainage ditch thru pasture close to corn. Killed on a farm where vigorous complaints had been made. In taking this meal this pheasant was very beneficial to the farmer.

Crop Contents

1 beetle, No. 17	1 kernel of corn
28 cutworms, sp?	23 kernels of barley, some sprouted

Gizzard Contents

5 ant heads, sp?	14 kernels of barley
3 snout beetles, No.89	1 kernel of oat
4 heads, snout beetles, No.89	1 seed of bindweed, No. 90
7 beetle heads	6 seeds yellow foxtail, No.25
5 - No.17: 2 - sp?	1 seed wild rose, No. 66
72 beetle mandibles	4 unidentified seeds
60 - No.17: 12 - sp?	7.2 cc.conglomerate vegetation
2.1 cc.ground up beetles, sp ?	
8 cricket mandibles, sp?	
16 cutworms, sp?	
6 heads & 58 mandibles of cutworms, sp?	

419 stones = 3.1 cc.

BIRD NO.462 - Male - Adult - from northeastern Davison County. Shot June 18, 1929, at 7:05 P.M., in oat field (oats 8 inches high) which was in corn last year. The surrounding fields were of corn (6 to 8 inches high), wheat and barley. Bird was observed first in corn field, but it worked into oats where it was killed.

Crop Contents

2 corn field ants, No.150	31 kernels of corn, some sprouted
1 leaf beetle, No. 44	1 kernel of oat
8 cutworms, sp?	1 kernel of wheat
hind leg of grasshopper, sp?	4 seeds wood sorrel, No. 79
	0.5 cc.conglomerate vegetation

Gizzard Contents

1 ant mandible, sp?	2 kernels of corn & 25 fragments
3 beetle heads, sp?	10 cc.conglomerate vegetation
7 beetle mandibles	
4 - No. 17: 3 - sp?	
0.7 cc.ground up beetles, sp?	
2 cutworms, sp?	
35 cutworm mandibles, sp?	
1 grasshopper mandible, sp?	

135 stones = 4 cc.

BIRD NO.463 - Male - Adult - from northwestern Hanson County. Shot June 24, 1929, at 7:30 P.M., in sweet clover and weed patch next to alfalfa, native grass, corn and wheat.

Crop Contents

2 grasshoppers, No.106	38 kernels of corn (29 definitely unsprouted, 9 questionably so)
1 spider, No. 188	0.4 cc.conglomerate vegetation

3 stones

Gizzard Contents

3 heads, snout beetles, No.89	25 fragments of kernels of corn
1 click beetle, No. 62	2 seeds yellow foxtail, No.25
1 beetle head, sp?	1 seed knotweed, No. 46
27 beetle mandibles 18 - No.17: 9 - sp?	3 seeds wild buckwheat, No.42
5 cricket mandibles, sp?	9.3 cc.conglomerate vegetation
7 cutworm mandibles, sp?	
16 grasshopper mandibles, sp?	
0.8 cc.ground up beetles, crickets & grasshoppers, sp?	

325 stones = 3.4 cc.

BIRD NO.464 - Male - Adult - from northwestern Hanson County. Shot June 29, 1929, at 6:50 A.M., in a native grass pasture along a drainage ditch. Adjoining the pasture were fields of corn (6 inches high) and wheat on last year's corn ground.

Crop Contents

	4 kernels of corn
	3 rush pods containing 663 seeds, No. 36
	1 seed of violet, No. 85

Gizzard Contents

6 heads & 2 mandibles of ants, sp?	2 kernels of corn & 32 fragments
12 beetle mandibles 9 - No.17: 3 - sp?	10.2 cc.oat hulls
0.57 cc.ground up beetles, sp?	1 seed of yellow foxtail, No.25
5 cutworm mandibles, sp?	3 seeds panic grass, No. 22
	39 seeds of violet, No. 85
	1 unidentified seed

137 stones = 3.3 cc.

BIRD NO.465 - Male - Adult - from northeastern Davison County. Shot July 7, 1929, at 8:00 P.M., in the grass along highway, between fence and corn field. Alfalfa, oats, wheat and a grove of trees nearby.

Crop Contents

9 maggots, No. 172	32 kernels of corn (27 deninitely unsprouted, 5 questionable)
1 stink bug, No. 136	0.6 cc.conglomerate vegetation

Gizzard Contents

2 beetle mandibles 1 - No.17; 1 - sp?	2 kernels of corn & 17 fragments
0.1 cc.ground up beetles, sp?	12.5 cc.conglomerate vegetation
1 grasshopper, sp?	
4 grasshopper mandibles, sp?	

181 stones = 3.5 cc.

BIRD NO. 466 - Adult - from northwestern Hanson County. Shot July 11, 1929, at 8:00 P.M., on a grass knoll along an unused section line. Oats, barley and corn nearby.

Crop Contents

1 moth pupa, sp?	5 kernels of corn (unsprouted)
	120 kernels of barley
	302 kernels of oats
	7 kernels of wheat
	13 cc.conglomerate vegetation

1 fairly large stone

Gizzard Contents

1 ant head, sp?	3 kernels of barley
1 head of snout beetle, No. 89	24 kernels of oats
1 bug head, sp?	3 seeds wild buckwheat, No.42
1 cutworm mandible, sp?	30.5 cc.conglomerate vegetation
4 grasshopper mandibles, sp?	
0.25 cc.ground up beetles, bugs & grasshoppers, sp?	

245 stones = 4.1 cc.

BIRD NO. 467 - Male - Adult - from southeastern Sanborn County. Shot July 19, 1929, at 6:10 P.M., in a native grass pasture, 4 rods from a road, which separated the pasture from wheat and oats that had been harvested with a combine.

Crop Contents

1 beetle, No. 72	13 kernels of oats
	11 kernels of wheat
	546 seeds green foxtail, No. 27
	1.1 cc.conglomerate vegetation

Gizzard Contents

1 head of snout beetle, No. 89	14 kernels of oats
1 beetle head, No. 31	29 kernels of rye
5 beetle mandibles,No.17	10 kernels of wheat
0.11 cc.ground up beetles, sp?	1 buffalo-grass spikelet, No.12
2 grasshopper mandibles, sp?	1 seed green foxtail, No. 27
	17 seeds yellow foxtail, No.25
	1 seed of puccoon, No. 93
	2 seeds wild buckwheat, No.42
	3 unidentified seeds
	10 cc.conglomerate vegetation

364 stones = 3.5 cc.

BIRD NO. 468 - Male - Young - from northeastern Davison County. Shot July 30, 1929, at 7:00 A.M., in a field of shocked oats. Corn, wheat, oats and native grass pasture were in bordering fields.

Crop Contents

2 beetles	95 kernels of oats
1 - No. 43	79 kernels of wheat
1 - No. 3	0.4 cc.conglomerate vegetation

Gizzard Contents

1 ant head, sp?	14 kernels of oats
1 beetle , No. 3	16 oat hulls
1 beetle mandible,sp?	33 kernels of wheat
2 grasshopper mandibles, sp?	4 seeds green foxtail, No. 27
	2 sandcherry pits, No. 63
0.2 cc.ground up beetles, sp?	1 seed wild buckwheat, No. 42

61 stones = 2.9 cc.

BIRD NO.469 - Male - Adult - from northeastern Davison County. Shot August 15, 1929, at 7:30 A.M., in a tomato patch, adjoining corn and wheat. Bird was killed on complaint of doing damage to tomatoes.

Crop Contents

1 leaf bug, No. 128	38 kernels of corn
1 butterfly pupa, No.184	10 cc.broken up kernels of corn
1 grasshopper, No.103	1 kernel of oat
1 snail, No. 190	13 kernels of wheat
1 spider, No. 188	19 seeds green foxtail, No. 27
1 tree-hopper, No. 125	

Gizzard Contents

2 beetle heads, sp?	15 kernels of wheat
10 beetle mandibles, sp?	603 seeds green foxtail, No. 27
1 caterpillar, No. 179	3 seeds yellow foxtail, No.25
11 grasshopper mandibles, sp?	16.6 cc.conglomerate vegetation
0.57 cc.ground up beetles and grasshoppers, sp?	

232 stones = 1.9 cc.

BIRD NO. 470 - Male - Young - from northeastern Davison County. Shot August 22, 1929, at 6:30 P.M., in a watermelon patch, adjoining oats, sugar cane and alfalfa. Bird was killed on complaint that it was doing damage to melons.

Crop Contents

1 owlet moth caterpillar, No. 183	4 kernels of wheat
	1 seed green foxtail, No. 27
	35 seeds yellow foxtail, No.25
	0.03 cc.conglomerate vegetation

Gizzard Contents

3 grasshopper mandibles, sp?	1 kernel of wheat
0.2 cc.ground up grasshoppers, sp?	19 seeds of bindweed, No. 90
	21 seeds green foxtail, No. 27
	113 seeds yellow foxtail, No.25
	7 seeds of smartweed, No. 44
	4.4 cc.conglomerate vegetation

236 stones = 2.1 cc.

BIRD NO.471 - Male - Young - from central Hanson County. Shot August 30, 1929, at 7:30 P.M., in rye stubble containing some white clover. Fields of oats, corn and a grove of trees bordered the stubble.

Crop Contents

15 grasshoppers	9 kernels of corn & 28 fragments
13 - No. 103	89 seeds green foxtail, No. 27
1 - No. 101	89 seeds yellow foxtail, No. 25
1 - No. 102	3.6 cc. conglomerate vegetation

Gizzard Contents

3 ant mandibles, sp?	48 seeds green foxtail, No. 27
8 beetle mandibles	353 seeds yellow foxtail, No. 25
7 - No. 17 · 1 - sp?	1 seed of knotweed, No. 46
1 caterpillar mandible, sp?	14 seeds smartweed, No. 44
1 grasshopper, No. 106	7 seeds Dakota vetch, No. 70
6 grasshopper mandibles, sp?	1 seed sweet clover, No. 74
0.86 cc. ground up beetles & grasshoppers, sp?	2 seeds wild buckwheat, No. 42
	6.6 cc. conglomerate vegetation

68 stones = 1.5 cc.

BIRD NO. 472 - Male - Young - from south central Davison County. Shot September 11, 1929, at 7:00 P.M., in oat stubble bordered by barley stubble, corn and native grass pasture.

Crop Contents

1 bug nymph, sp?	87 kernels of wheat, some sprouted
	0.6 cc. wheat hulls
	1 seed yellow foxtail, No. 25
	1 seed lamb's quarters, No. 49

Gizzard Contents

1 beetle head, No. 17	37 kernels of wheat, some sprouted
181 beetle mandibles, No. 17	80 seeds green foxtail, No. 27
8 cricket mandibles, sp?	47 seeds yellow foxtail, No. 25
31 grasshopper mandibles, sp?	10 seeds of smartweed, No. 44
2.2 cc. ground up beetles & grasshoppers, sp	1 seed sweet clover, No. 74
	9 cc. conglomerate vegetation

132 stones = 2.6 cc.

BIRD NO.473 - Male - Adult - from south central Davison County. Shot September 23, 1929, at 6:30 P.M., in field of shocked corn which was very weedy. Hay meadow and native grass pasture nearby.

Crop Contents

1 grasshopper, No.109	31 kernels of barley
2 tree crickets, No.112	3 seeds of blue-stem, No. 7
	322 seeds green foxtail, No. 27
	3 seeds yellow foxtail, No.25
	1 seed pod of black nightshade containing 44 seeds, No.98
	8 seeds little ragweed, No.107
	10 seeds of sorghum, No. 6
	83 seeds wild sunflower, No.114
	1 unidentified seed
	1.7 cc. conglomerate vegetation

11 stones = 0.03 cc.

Gizzard Contents

1 ant head, sp?	3 seeds barnyard grass, No.16
8 beetle mandibles, No.17	249 seeds green foxtail, No. 27
9 cricket mandibles, sp?	100 seeds yellow foxtail, No. 25
1 grasshopper head, sp?	1 seed of knotweed, No. 46
29 grasshopper mandibles, sp?	9 seeds of puccoon, No. 93
2.4 cc. ground up grasshoppers and one caterpillar, sp?	82 seeds of ragweed, No.109
	1 seed of smartweed, No.44
	1 seed sweet clover, No.74
	10 seeds wild buckwheat, No.42
	15 seeds wild rose, No. 66
	25 seeds wild sunflower, No.114
	12 seeds wild tomato, No. 100
	13.5 cc. conglomerate vegetation

297 stones = 1.8 cc.

BIRD NO.474 - Male - Adult - from southeastern Davison County. Shot September 25, 1929, at 6:30 P.M., in a field of shocked corn which was very weedy with foxtail grass. No other grain near. Hay meadow and grass pasture nearby.

Crop Contents

1 beetle grub, No.84	2 kernels of barley
1 leaf hopper, No. 120	38 kernels of emmer
1 spider, No. 188	28 seeds green foxtail, No. 27
	7 seeds yellow foxtail, No.25
	11 seeds wild sunflower, No.114
	0.1 cc. conglomerate vegetation

(BIRD NO.474 continued on next page)

(BIRD NO.474 - continued

Gizzard Contents

3 beetle mandibles, No.17	1 kernel of barley
18 cricket mandibles, sp?	19 kernels of emmer
35 grasshopper mandibles, sp?	33 seeds green foxtail, No. 27
0.8 cc. ground up grasshoppers, sp?	91 seeds yellow foxtail, No. 25
	2 seeds of knotweed, No. 46
	3 seeds of smartweed, No. 44
	3 seeds wild buckwheat, No. 42
	22 seeds wild rose, No. 66
	3 seeds wild sunflower, No. 114
	7.8 cc. conglomerate vegetation

73 stones = 9 cc.

BIRD NO.475 - Female- Adult - from north central Davison County. Shot September 30, 1929, at 9:00 A.M., in oat stubble, three rods from corn. Other fields adjoining the oats were barley, alfalfa and flax stubble.

Crop Contents

1 ant, No. 147	87 kernels of corn
1 leaf bug, No. 128	1 seed barnyard grass, No. 16
1 field cricket leg, No. 110	717 seeds green foxtail, No. 27
2 grasshoppers	434 seeds yellow foxtail, No. 25
1 - No. 103	2 seed pods of ground cherry containing 39 seeds, No. 97
1 - No. 109	10 seeds milky spurge, No. 81
	72 seeds wild tomato, No. 100
	1.5 cc. conglomerate vegetation

79 stones = 0.1 cc.

Gizzard Contents

2 ant mandibles, sp?	2 kernels of corn & 9 fragments
15 beetle mandibles,	79 seeds green foxtail, No. 27
14 - No. 17	147 seeds yellow foxtail, No. 25
1 - sp?	3 seeds of knotweed, No. 46
3 cricket mandibles, sp?	8 seeds little ragweed, No. 107
7 grasshopper mandibles, sp?	3 seeds of smartweed, No. 44
0.25 cc. ground up beetles and grasshoppers, sp?	1 seed wild buckwheat, No. 42
	1 seed wild rose, No. 66
	15 seeds wild tomato, No. 100
	7.9 cc. conglomerate vegetation

439 stones = 1.8 cc.

BIRD NO.476 - Male - Adult - from east central Aurora County. Shot October 13, 1929, at 6:10 P.M., in sweet clover stubble, 3 rods from grove and 5 rods from corn. Fall plowing directly across the road.

Crop Contents

5 grasshoppers	10 kernels of corn & 5 fragments
4 - No. 103	7 kernels of wheat
1 - No. 106	1536 seeds green foxtail, No. 27
	21 seeds yellow foxtail.No.25
	1 seed old-witch grass, No.19
	1 seed wild buckwheat,No. 42
	9 seeds wild sunflower,No.114
	1.3 cc.conglomerate vegetation

Gizzard Contents

16 beetle mandibles, No. 17	1 kernel of wheat
1 grasshopper,No.102	3 seeds of bindweed, No. 90
16 grasshopper mandibles, sp?	769 seeds green foxtail, No. 27
0.67 cc.ground up grasshoppers, sp?	36 seeds yellow foxtail, No.25
	1 seed old-witch grass, No.19
	1 seed little ragweed, No.107
	1 seed wild tomato, No. 100
	8 cc.conglomerate vegetation

215 stones = 2.1 cc.

BIRD NO.477 - Male - Adult - from east central Aurora County. Shot October 20, 1929, at 5:45 P.M., in road ditch which contained sweet clover. Corn on both sides of the road.

Crop Contents

339 seeds green foxtail, No. 27
5 seeds yellow foxtail,No. 25
1.5 cc.foxtail bristles
66 seeds black nightshade and 1 pod containing 28 seeds No. 98
2 seeds sweet clover, No. 74
1 seed wild buckwheat, No.42
322 seeds wild sunflower, No.114

25 stones = 0.07 cc.

Gizzard Contents

2 beetle mandibles, No.17	30 seeds green foxtail, No. 27
3 grasshopper mandibles, sp?	4 seeds yellow foxtail, No.25
0.5 cc.ground up grasshoppers, sp?	2 seeds wild buckwheat, No.42
	1 seed wild rose, No. 66
	168 seeds wild sunflower,No.114
	126 seeds & 6 spherules of wild tomato, No. 100
	12.2 cc.conglomerate vegetation

476 stones = 4.2 cc.

BIRD NO.478 - Male - Adult - from southwestern Hanson County. Shot October 29, 1929, at 5:30 P.M., in a corn field, 4 rods from rye stubble. Corn was hand picked.

Crop Contents

5 beetle grubs,No.17	6 kernels of corn 780 seeds green foxtail, No. 27 3 seeds yellow foxtail, No.25 2 seeds rough pigweed, No. 52 25 seeds wild sunflower, No.114 0.5 cc.conglomerate vegetation

Gizzard Contents

6 ant heads, sp? 0.2 cc.ground up ants, sp? 2 beetle mandibles,sp? 1 grasshopper mandible, sp?	12 fragments of kernels of corn 1 seed bur-reed, No. 2 368 seeds green foxtail, No. 27 425 seeds yellow foxtail,No. 25 2 seeds lamb's quarters,No.49 14 seeds Dakota vetch, No. 70 6.1 cc.conglomerate vegetation

220 stones = 2.7 cc.

BIRD NO.479 - Male - Adult - from central Sanborn County. Shot October 31, 1929, at 9:45 A.M., on fall plowing. Corn field on opposite side of road, being picked by machine. Corn very weedy.

Crop Contents

	22 kernels of corn 207 seeds green foxtail, No. 27 331 seeds yellow foxtail, No.25 0.38 cc.conglomerate vegetation

Gizzard Contents

1 ant head, sp? 15 beetle mandibles,sp? 2 cricket mandibles,sp? 2 grasshopper mandibles, sp? 0.17 cc.ground up insects, sp?	38 fragments of kernels of corn 167 seeds green foxtail, No. 27 51 seeds yellow foxtail,No. 25 2 seeds little ragweed, No.107 2 seeds sweet clover, No. 74 6 seeds wild buckwheat, No.42 30 seeds wild sunflower, No.114 48 seeds wild tomato, No.100 7.4 cc.conglomerate vegetation

275 stones = 2.2 cc.

BIRD NO.480 - Male - Adult - from southeastern Hanson County. Shot November 23, 1929, at 10:30 A.M., in field of sweet clover, bordered by oat stubble, native grass pasture, fall plowing and hand-picked corn.

Crop Contents

11 Kernels of corn
255 seeds green foxtail, No.27
4 cc.conglomerate vegetation (some grass leaves)

Gizzard Contents

47 seeds green foxtail, No.27
1 seed of knotweed, No. 46
1 seed of sedge, No. 35
2 seeds sweet clover, No. 74
1 seed Dakota vetch, No. 70
20 cc.conglomerate vegetation

436 stones = 4.5 cc.

BIRD NO.481 - Male - Adult - from central Sanborn County. Shot December 5, 1929, at 10:00 A.M., in a bunch of willows along a road ditch. Corn, pasture and fall plowing nearby.

Crop Contents

27 kernels of corn
348 seeds green foxtail, No.27
17 seeds yellow foxtail, No.25
0.1 cc.conglomerate vegetation

3 stones = 0.17 cc.

Gizzard Contents

4 kernels of corn & 30 fragments
1 seed of burdock, No. 110
12 seeds green foxtail, No. 27
8 seeds yellow foxtail, No.25
2 seeds of vervain, No. 94
2 seeds of wolfberry, No.104
6.9 cc.conglomerate vegetation

253 stone = 4.4 cc.

BIRD NO.482 - Male - Adult - from east central Davison County. Shot December 10, 1929, at 1:30 P.M., in field of shocked corn. Corn, oat stubble and native pasture bordered this field. Bird was feeding in the corn. The ground was covered with snow.

Crop Contents

11 kernels of corn & 15 fragments
0.33 cc.conglomerate vegetation

Gizzard Contents

6 seeds giant ragweed, No.108
1 seed sweet clover, No. 74
13 seeds wild rose, No. 66
22 seeds of wolfberry, No.104
12 cc.conglomerate vegetation
102 stones = 2.1 cc.

BIRD NO.483 - Male - Adult - from southeastern Sanborn County. Shot December 19, 1929, at 1:00 P.M., in wheat stubble bordered by corn and fall plowing. Pasture across the road.

Crop Contents

160 kernels of wheat
6.5 cc.wheat chaff
3 seeds green foxtail, No. 27
3 seeds yellow foxtail, No. 25
1 seed Russian thistle, No. 50

Gizzard Contents

24 kernels of wheat
8 seeds yellow foxtail, No.25
1 seed wild buckwheat, No. 42
24 seeds wild rose and 10 fragments, No. 66
13 cc.conglomerate vegetation
183 stones = 2.5 cc.

BIRD NO.484 - Male - Adult - from northeastern Davison County. Shot December 22, 1929, at 1:25 P.M., in sweet clover along the road. Corn on both sides of the road, extending for nearly a half mile.

Crop Contents

50 kernels corn & 4 fragments
6 seeds green foxtail, No. 27
29 seeds Jady's thumb, No. 45
1 seed wild buckwheat, No.42
0.17 cc.conglomerate vegetation

(BIRD NO.484 continued on next page)

(BIRD NO.484 - continued)

Gizzard Contents

	4 kernels corn & 10 fragments
	46 seeds green foxtail, No. 27
	35 seeds lady's thumb, No. 45
	3 seeds of smartweed, No. 44
	1 seed Dakota vetch, No. 70
	1 seed wild buckwheat, No. 42
	7.8 cc.conglomerate vegetation

318 stones = 3.3 cc.

BIRD NO.485 - Male - Adult - from west central Hanson County. Shot January 10, 1930, at 2:30 P.M., in a clump of willows in a pasture. No corn or small grain within a half mile.

Crop Contents

2 field crickets, No.110	11 kernels of corn
18 grasshoppers: 11 -No.109;	1 seed of grape, No. 84
3 - No.103: 2 - No.104	2 cc.conglomerate vegetation
1 - No. 91: 1 - No.108	

Gizzard Contents

1 cricket mandible, sp?	5 fragments of kernels of corn
52 grasshopper mandibles, sp?	6 seeds of grape, No. 84
	4 seeds giant ragweed, No.108
2.2 cc.ground up crickets & grasshoppers, sp?	52 seeds Dakota vetch, No.70
	9 cc.conglomerate vegetation

310 stones = 3.8 cc.

BIRD NO.486 - Male - Adult - from southeastern Sanborn County. Shot January 26, 1930, at 1:30 P.M., in field of shocked corn, surrounded by corn and fall plowing. Six or seven inches of snow on the ground.

Crop Contents

	28 kernels of corn
	3 seeds wild sunflower, No.114
	4 fragments of grass leaves

Gizzard Contents

2 small bits of insects, sp?	4 kernels corn & 54 fragments
	1 seed of bindweed, No.90
	26 seeds green foxtail, No. 27
	21 seeds yellow foxtail, No. 25
	25 seeds Russian thistle, No.50
	2 seeds of smartweed, No. 44
	7 seeds wild buckwheat, No.42
	26 seeds wild rose, No. 66
	8 cc.conglomerate vegetation

429 stones = 3.2 cc.

BIRD NO.487 - Male - Adult - from north central Davison County. Shot January 30, 1930, at 2:30 P.M., among trees in pasture. All surrounding fields were of corn. Six or seven inches of snow was on the ground. Bird crossed road from corn to trees.

Crop Contents

15 kernels of corn
3 cc. corn fragments

Gizzard Contents

3 bits of beetle, sp?

21 fragments of kernels of corn (1 cc.)
4 seeds of gumweed, No. 113
1 seed little ragweed, No.107
1 seed Dakota vetch, No. 70
65 seeds wild rose, No. 66
1 seed wild sunflower, No.114
7.5 cc. conglomerate vegetation

281 stones = 2.9 cc.

BIRD NO.488 - Male - Adult - from east central Hanson County. Shot February 16, 1930, at 1:00 P.M., in stubble field bordered by corn, fall plowing and a grove.

Crop Contents

26 kernels of corn
61 kernels of barley
9 seeds green foxtail, No. 27
29 seeds yellow foxtail, No.25
1 sporocarp, water fern, No. 1
1.1 cc. conglomerate vegetation

Gizzard Contents

2 beetle mandibles, sp?
2 grasshopper mandibles, sp?
0.6 cc. ground up grasshoppers, sp?

1 kernel corn & 3 fragments
2 kernels of barley
2 seeds green foxtail, No. 27
26 seeds yellow foxtail, No.25
2 seeds of smartweed, No. 44
4 seeds two-leaved Solomon's seal, No. 38
5 seeds of vervain, No. 94
5 sporocarps, water fern, No.1
2 seeds wild buckwheat, No.42
7.3 cc. conglomerate vegetation

557 stones = 3 cc.

BIRD NO.489 - Male - Adult - from southeastern Sanborn County. Shot February 23, 1930, at 4:00 P.M., in a corn field bordered by oat stubble, native pasture and alfalfa.

Crop Contents

60 kernels of corn
1 kernel of oat
1 seed Dakota vetch, No. 70
1 seed wild sunflower, No.114
0.3 cc.conglomerate vegetation

Gizzard Contents

3 kernels of corn & 19 fragments
9 seeds wild rose, No. 66
11.5 cc.conglomerate vegetation

242 stones = 3.7 cc.

BIRD NO.490 - Male - Adult - from east central Sanborn County. Shot March 16, 1930, at 4:30 P.M., in an alfalfa field bordered by corn, oat stubble and fall plowing.

Crop Contents

17 kernels of corn
8 seeds green foxtail, No.27
1 seed Russian thistle, No.50
1 seed wild liquorice, No.69
2 seeds wild tomato, No. 100
0.5 cc.alfalfa leaves

Gizzard Contents

3 beetle mandibles, sp?
bits of broken up beetles, sp?

2 kernels of corn & 12 fragments
9 cc. corn bran
2 seeds barnyard grass, No. 16
2 seeds green foxtail, No. 27
7 seeds lamb's quarters, No.49
3 seeds Russian thistle, No.50
5 seeds sweet clover, No. 74
15 seeds wild rose, No. 66
91 seeds wild tomato, No.100

245 stones = 2.1 cc.

BIRD NO.491 - Adult - from north central Jerauld County. Shot March 18, 1930, at 6:30 P.M., in hogged down corn, bordered by sweet clover, native grass pasture and plowing.

Crop Contents

7 grasshoppers	1 kernel of corn
2 - No. 106	1 kernel of barley
2 - No. 109	14 seeds green foxtail, No. 27
2 - No. 103	4 seeds yellow foxtail, No.25
1 - No. 101	

Gizzard Contents

66 grasshopper mandibles, sp?	6 fragments of kernels of corn
5 cc.ground up grasshoppers, sp?	27 kernels of barley
	17 seeds of bindweed, No. 90
	1 seed green foxtail, No. 27
	7 seeds yellow foxtail, No. 25
	2 seeds of knotweed, No. 46
	15 seeds giant ragweed, No.108
	2 seeds little ragweed, No.107
	1 seed wild buckwheat, No. 42
	9 cc.conglomerate vegetation

193 stones 2.5 cc.

BIRD NO.492 - Male - Adult - from northwestern Davison County. Shot March 25, 1930, at 4:30 P.M., in a stubble field, 4 rods from native grass pasture and 30 rods from corn field. Grove nearby.

Crop Contents

4 kernels of corn

Gizzard Contents

1 ant head, sp?	3 kernels of corn & 19 fragments
2 beetle mandibles, sp?	1 seed green foxtail, No. 27
0.05 cc.ground up beetles, sp?	4 seeds Dakota vetch, No. 70
	43 seeds wild rose, No. 66
	8.5 cc.conglomerate vegetation

317 stones = 3 cc.

BIRD NO.501 - from Beadle County. Killed in October,1929. No other information sent in.

Crop Contents

6 bugs	11 kernels of corn
4 - No. 136	9 kernels of oats
2 - No. 137	18 kernels of wheat
3 caterpillars, No. 183	6 buds, sp?
10 grasshoppers	4 seeds green foxtail, No. 27
7 - No. 103	14 seeds yellow foxtail, No.25
2 - No. 105	1 seed of psoralea, No. 75
1 - No. 109	1 seed little ragweed, No.107
	2 seeds Russian thistle,No.50
	1 seed wild buckwheat, No. 42
	23 seeds wild sunflower, No.114
	1 cc.conglomerate vegetation

Gizzard Contents

1 beetle mandible,No.17	14 kernels of oats
1 caterpillar mandible, sp?	75 seeds green foxtail, No. 27
7 cricket mandibles, sp?	69 seeds yellow foxtail, No.25
1 grasshopper, No. 103	7 seeds of psoralea, No. 75
33 grasshopper mandibles, sp?	27 seeds little ragweed, No.107
1 millipede, No. 189	13 seeds Dakota vetch, No. 70
1.3 ground up crickets & grasshoppers, sp?	20 seeds wild buckwheat, No.42
	2 seeds wild rose, No. 66
	9 seeds wild sunflower,No.114
	8.2 cc.conglomerate vegetation

290 stones = 3.1 cc.

BIRD NO. 502 - Male - Adult - from north central Beadle County. Shot October 25, 1929, at 4:00 P.M., at side of road. Wheat stubble on north side of road; picked corn field on south side.

Crop Contents

1 beetle, No. 17	76 kernels of corn
2 false chinch bugs, No. 123	21 kernels of wheat
2 legs of grasshoppers, sp?	2 seeds green foxtail, No. 27
	1 seed yellow foxtail, No. 25
	4 seeds wild rose, No. 66
	1 seed wild sunflower, No.114
	3.5 cc.leaves, sp?

Gizzard Contents

2 beetle mandibles, No.17	12 kernels,corn & 37 fragments
8 grasshopper mandibles, sp?	1 seed of bindweed, No. 90
0.2 cc.ground up grasshoppers, sp?	1 seed of foxtail, No. 28
	8 seeds wild buckwheat, No.42
	22 seeds wild rose, No. 66
	5 seeds wild sunflower, No.114
	1 unidentified seed
	8.9 cc.conglomerate vegetation

173 stones = 2.4 cc.

BIRD NO.503 - Male - Adult - from north central Beadle County. Shot November 15, 1929, at 5:00 P.M., in stubble field surrounded by corn.

Crop Contents

1 field cricket, No.110	124 kernels of corn
3 snails, No. 190	44 kernels of oats
1 spider, No. 188	362 seeds green foxtail, No. 27
	1 seed yellow foxtail, No. 25
	1 seed milkweed, No. 88
	14 seeds little ragweed, No.107
	1 seed rough pigweed, No. 52
	2 seeds small rush grass, No.29
	1 seed sweet clover, No. 74
	3.5 cc.conglomerate vegetation, some oat chaff

Gizzard Contents

1 beetle mandible,No.13	7 kernels of corn & 28 fragments
	5 kernels of oats
	4 seeds of bindweed, No. 90
	1 seed green foxtail, No. 27
	3 seeds yellow foxtail, No. 25
	1 seed little ragweed, No.107
	16 seeds sweet clover, No. 74
	1 seed Dakota vetch, No. 70
	9 cc.conglomerate vegetation

293 stones = 3 cc.

BIRD NO.504 - Male - Adult - from north central Beadle County. Shot December 4, 1929, at 2:30 P.M., on pasture land, some distance from any fields of grain.

Crop Contents

	111 kernels of wheat
	4.7 cc. wheat chaff
	24 seeds green foxtail, No. 27
	21 seeds yellow foxtail, No. 25
	2 seeds wild buckwheat, No.42

Gizzard Contents

2 beetle mandibles,No.17	1 kernel of barley
1 beetle mandible, No.13	5 kernels of wheat
6 grasshopper mandibles, sp?	43 seeds green foxtail, No. 27
0.7 cc.ground up grasshoppers, sp?	22 seeds yellow foxtail,No. 25
	5 seeds giant ragweed, No.108
	1 seed rough pigweed, No. 52
	1 seed of sedge, No. 35
	7 seeds sweet clover, No. 74
	4 seeds wild buckwheat, No.42
	19 cc.conglomerate vegetation

223 stones = 4.3 cc.

SUMMARY

Ring-necked pheasants were first introduced into South Dakota in 1912 when about 300 birds were released by the State Game and Fish Department. All told, approximately 7,000 pheasants were purchased by this department and liberated in the State. This original stock increased so prolifically that it is estimated appoximately two million birds were shot by licensed hunters during each of the open seasons of 1927 and 1928. It is undoubtedly true that more than a million pheasants were taken by hunters during each hunting season since 1928.

In such areas where the ring-necked pheasant has built up a large population, the economic status of the bird has become a controversial matter of considerable importance, Reports of damage to farm and garden crops range from severe to negligible, while a large number of farmers and truckers claim that they experienced no damage from the activities of the pheasant whatsoever. Because such contradictory opinions were held by our farmers and gardeners, it was deemed advisable by the State Department of Game and Fish that an investigation be made of the food eaten by our pheasants. Such an investigation was made and was based upon an analysis of the crop and gizzard contents of 285 pheasants. The birds were obtained from all representative areas of the State where the pheasant was able to maintain itself in goodly numbers. Ten to 31 pheasant food tubes were sent us per month for study. In November, December, January, February and March, the food tubes sent us numbered 10 to 14 per month, while during the remainder of the year they totaled 24 to 38 per month.

It is undoubtedly true that much of the ill feeling towards the pheasant has arisen because of the damage that is done to farm property by the thoughtless, selfish and viscious hunter. In addition, the hunters of pheasants have caused many of our farmers considerable worry, not only from the angle of possible property losses but even from the personal safety viewpoint. Since such are the facts, it is not surprising to find an ever increasing number of farms on which hunting is forbidden or on which hunting is forbidden without permission.

Pheasants obtain their food principally from the surface of the ground or from low growing plants. An enormous variety of animal and plant materials are consumed as food, but the pheasant must be considered essentially a granivorous or seed-eating species.

While the pheasant exercises some choice in picking out its food, the diet depends largely upon the species of seeds and insects that are available, upon the abundance of each species, and upon the ease with which the species are found and picked up. Ordinarily, no two birds take the same kind and quantity of food

in any one meal, a fact which is not surprising when one remembers that the pheasant eats a large variety of seeds and insects and that the pheasant covers considerable territory in wandering about in search of food.

While the vegetable matter eaten by our pheasants consisted chiefly of seeds, a small number of plant galls, seed pods, berries, fruits and fruit pits, and a small quantity of leaves, stems and roots of plants were also taken.

Plants whose seeds were found in the food tubes of our pheasants totaled 116 species. The bulk of the seeds eaten were included in the grass family (Gramineae), while seeds of Compositae (Composite family), Polygonaceae (buckwheat family), Rosaceae (rose family), Leguminosae (pulse family), Solanaceae (nightshade family), Violaceae (violet family), and Caperfoliaceae (honeysuckle family) made up most of the remainder. A total of 140,219 seeds were found in the crops and gizzards of our 285 pheasants, which averages approximately 492 seeds per bird. Economically considered, approximately 25.7 per cent of these seeds were useful to man, 34.8 per cent were neutral in character, and 39 per cent were harmful.

Approximately 226.6 seeds were eaten during an average meal by each of our pheasants. Seeds eaten in the largest quantity were the following:

KINDS OF SEED	CLASSIFICATION	AVERAGE NUMBER OF SEEDS PER CROP
corn	useful	18.15
wheat	useful	28.1
barley	useful	20.8
oats	useful	16.3
flax	useful	4.2
rye	useful	1.64
millet	useful	1.4
wolfberry	useful	11.58
green foxtail	harmful	53.35
yellow foxtail	harmful	19.47
wild buckwheat	harmful	9.29
blue eyed grass	neutral	8.06
little ragweed	harmful	4.17
wood sorrel	neutral	3.77
wild sunflower	harmful	3.54
wild oat grass	neutral	3.24
wild oats	harmful	2.47
Russian thistle	harmful	2.14
Dakota vetch	neutral	2.16
barnyard grass	harmful	2.12
rush	neutral	1.89
violet	neutral	1.78

Harmful seeds that were found in the crops of our pheasants, but were not included in the above because they were eaten in small quantities, were wild barley, old witch grass, knotweed, smartweed, willow-leafed dock, lambs quarters, spreading pigweed, peppergrass, pink cleome, Missouri cactus, gaura, creeping jenny, hedge bindweed, black nightshade, buffalo bur, beggars tick, prairie thistle, prickly lettuce and dandelion. Useful seeds that were not included in the list referred to, but were found in the crops of our birds were meadow foxtail, sorghum, blue stem, false timothy, proso millet, emmer, buckwheat, garden asparagus, bramble, alfalfa, sweet clover, vetch and wild grape. Neutral seeds that were found in small quantity in the crops and, therefore, not listed amongst the seeds eaten in largest quantity were alkali grass, switch grass, panic grass, small rush grass, feather grass, sedge, two-leaved Solomon seal, cinquefoil, wild rose, wild liquorice, psoralia, cut-leafed cranesbill, milky spurge, sumach, milkweed, illisia, narrow-leafed puccoon, vervain, ground cherry, wild tomato and marsh elder.

Corn is the most important single food item in the diet of the pheasant in South Dakota. A total of 121 birds, or approximately 42 per cent of the entire lot examined, had corn in their crops. In July and August only 17.1 and 20.6 per cent of the pheasants examined had corn in this compartment of the food tube, while for the remainder of the months the averages ran from 41.7 to 70 per cent (Figure 2). A total of 4,114 kernels of corn were found in the crops of our 285 pheasants, and each bird ate 18 kernels, on an average, per meal. The largest number of kernels of corn found in any one crop was 230. The average number of kernels of corn found, by months, in each of the crops of our 285 pheasants was approximately as follows:

January	43 kernels	October	16 kernels
November	36 "	September	16 "
December	25 "	April	12 "
March	21 "	June	8 "
May	19 "	August	3 "
February	18 "	July	2 "

From the data available, one must conclude that a smaller percentage of birds eat corn during July and August than during any other month of the year, and further, those birds that do eat corn, eat less of it during July and August than during any other months of the year. This is probably due to the fact that there is less corn available in July and August than in any other month of the year.

During May and June, 38 and 33 pheasant food tubes, respectively were examined. A total of 949 kernels of corn were found in these food tubes, but only 4 kernels were definitely sprouted and 26 were questionably sprouted. It should be emphasized that corn is usually planted some time during May in South Dakota and that it has germinated and made considerable growth by the first of July.

Undoubtedly much of the corn eaten by pheasants is waste grain. Some of the grain eaten in the fall and winter is undoubtedly grain taken from standing corn before it has been picked or hogged off. We have no direct evidence that pheasants pull very much sprouted corn or peck out planted corn, for our investigation was not based on actual field observations. However, Maxson (5) reports that pheasants in Colorado cause considerable damage to corn by pulling it, while Swenk (10) writes that there is plenty of good evidence that the pheasant does pull newly sprouted corn.

Of the small grains grown in South Dakota, wheat, barley, oats, rye and emmer, in the order named, are eaten most abundantly by our pheasants.

Wheat was found in 91 crops of the 285 examined, or in 32 per cent of the total (Figure 5). Each crop contained approximately 58 grains on an average. The largest number of grains of wheat found in any one crop was 915 (Figure 6). Undoubtedly most of the wheat eaten by pheasants is waste grain. Only 50 sprouted kernels of wheat were found in the crops of our birds, but since we do not know the circumstances or conditions under which these were obtained, some or even all of it may have been waste grain.

Barley was found in 91 of the 285 crops examined, or in approximately 32 per cent of the total (Figure 7). Each crop of the 285 examined averaged approximately 21 grains (Figure 8). The largest number of seeds of barley found in any one crop was 952. Only 4 sprouted kernels of barley were found in the 285 pheasant crops furnished us. From the evidence at hand, we must conclude that most of the barley eaten was waste grain and that little sprouted grain is eaten.

Oats were found in 80 of the 285 pheasant crops examined or in approximately 28 per cent of the total (Figure 9). Each crop averaged slightly more than 16 kernels of oats (Figure 10) but strange to say, not a single kernel of oats in the crops was sprouted. Evidently most of the oats eaten by pheasants is waste grain and little sprouted oats is taken.

Only six pheasant crops contained rye and only eight contained emmer. A total of 619 kernels of rye were found in the six crops and 72 kernels of emmer were found in the eight crops. None of the rye or emmer found in the crops was sprouted. If one bears in mind the smaller acreage of rye and emmer grown in South Dakota as compared to wheat, barley and oats, one is not surprised to find that relatively few pheasants had rye or emmer in their crops.

The seeds of green foxtail were found in the crops of 100 of the pheasants which we examined or in 35 per cent of the total. While the number of such seeds in the crops varied from 0 to 1536, each crop, on an average, contained 53. Our pheasants consumed the largest amounts of green foxtail seed during August, September, October and November, and it was during these same months that the highest percentage of the pheasants fed on such seeds (Figure 13).

The seeds of yellow foxtail were found in the crops of 74 of our pheasants, or in approximately 26 per cent of the total. The number of seeds per crop varied from 0 to 1532, while an average crop contained approximately 19. The months during which the largest percentage of our pheasants contained the seeds of yellow foxtail were August, September, October and November, a condition identical to that pertaining with green foxtail seed. However, the four months during which the pheasants consumed the largest amounts of yellow foxtail seeds were September, April, August and February, which was radically different from that obtained with yellow foxtail seed.

The seeds of wild buckwheat were found in 31 pheasant crops, or in approximately 11 per cent of the 285 examined. (Figure 15). The number of such seeds in the individual crops varied from 0 to 717 and averaged approximately 9 seeds per crop for the entire year (Figure 16). The largest quantities of wild buckwheat seeds were eaten in February and November when 53 and 52 seeds respectively were found, on an average, in each crop examined. The percentages of pheasants per month that fed upon these seeds varied from 2.9 to 21.4, the largest percentages being for the months of October, February, April, November and December when at least 20 per cent of the crops examined contained the seeds of wild buckwheat.

Seeds of wild sunflower were found in 30 pheasant crops, or in approximately 11 per cent of the total crops examined (Figure 19). Most, but not all of these seeds, were those of the common sunflower, Helianthus annuus L. The number of sunflower seeds in the crops varied from 0 to 322 and averaged 3.5 seeds per crop. The largest quantity of such seeds was eaten in September and October, when each pheasant crop contained approximately 13 and 25 seeds respectively. More pheasants had sunflower seeds in their crops during October and September than during any other months and then followed January, March, November, February and April in the order named.

The seeds of little ragweed were found in the crops of only 16 of our pheasants, or in approximately six per cent of the entire lot of birds (Figure 17). The number of such seeds per crop varied from 0 to 406 and averaged approximately four seeds per bird for the year (Figure 18). The largest quantity of seeds of

little ragweed was eaten by our pheasants during September, February, October, March and January, while during the remaining months of the year, either no little ragweed seeds were eaten at all or very small quantities were consumed. The percentages of pheasants that contained little ragweed seeds in their crops, by months of the year, was highest for September, followed by February, October, November, March, January, June, August and April. None of the pheasant crops sent us during May, July or December contained any little ragweed seed whatsoever.

While pheasants eat a large number of noxious weed seeds, they do not reduce the numbers of such seeds per acre sufficiently to make any practical difference to the farmer or gardener.

The animal food eaten by our pheasants consisted principally of insects, but a comparatively small number of spiders, millipedes and snails and a small amount of broken up pheasant egg shells were also taken. A total of 3,471 complete or nearly complete animals were found in the crops and gizzards of the pheasants, but of this number 3,375, or 97 per cent, were insects. Forty per cent of the animals eaten by our pheasants were flies and their larvae. Next in order were the Orthoptera (grasshoppers, crickets and katydids) with 20 per cent and then followed the Coleoptera (beetles) with 16 per cent, the Hymenoptera (wasps, ants, ichneumon flies) with 11 per cent, the Lepidoptera (moths, butterflies and caterpillars) with 9 per cent, the Hemiptera and Homoptera (bugs) with 2 per cent and the Neuroptera (lacewing flies) with 0.3 per cent. Spiders constituted 2 per cent of the total number of animals eaten while the Diplopoda (millipedes) and the snails accounted for 0.5 and 0.4 per cent respectively.

Forty per cent of the entire lot of animals eaten by our pheasants were classed as harmful to man, three per cent were useful, 27 per cent neutral and 30 per cent doubtful.

A total of 1,379 flies or their larvae were found in the food tubes of our pheasants. The identified flies represented at least 11 species and 10 families. A single species of fly and its larvae, the white-winged march fly, accounted for 947 of the total number of Diptera consumed, while a single species of borborid fly accounted for 394 of the remainder. Economically considered, the Diptera consumed by our pheasants may be grouped into the following classes: number of harmful species--0 per cent, number of specimens useful to man -- 0.5 per cent, number of neutral specimens -- approximately 30 per cent, number of specimens with a questionable economic classification -- approximately 70 per cent. However, since each pheasant averages only slightly more than 3 flies or fly larvae per meal, it must be concluded that flies form a minor item in the diet of the pheasant.

A total of 676 Orthoptera were found in the food tubes of our pheasants. Of this number 431 were grasshoppers, 230 were crickets and 15 were katydids and meadow grasshoppers.

Only 63 of the pheasant crops examined, or approximately 22 per cent of the total crops, contained grasshoppers. The percentage of pheasants, by months, whose crops contained grasshoppers were as follows:

January	14 per cent	July	22.9 per cent
February	7 " "	August	38.2 " "
March	30.8 " "	September	50 " "
April	17.6 " "	October	42.3 " "
May	0 " "	November	30 " "
June	6.1 " "	December	10 " "

The average number of grasshoppers found, by months, in each of the crops of our 285 pheasants was as follows:

January	1.43 grasshoppers	July	0.94 grasshoppers
February	0.21 "	August	1.5 "
March	1.08 "	September	7.58 "
April	0.35 "	October	2.27 "
May	0 "	November	0.7 "
June	0.09 "	December	0.2 "

Practically all of the grasshoppers found in the food tubes of our pheasants during November, December, January, February, March and April were specimens that were dead when they were picked up by the birds. The grasshoppers found in the crops during these months totaled 58 specimens or approximately 15 per cent of the entire lot of locusts found in the crops of all of our birds. It should be borne in mind that it did not reduce the live grasshopper population to have the pheasants pick up and devour these dead grasshoppers and, further, it did not reduce the number of grasshopper eggs in the soil. However, it did increase the percentage of pheasants that fed upon grasshoppers and it increased the number of grasshoppers taken per meal.

During September each pheasant consumes 7.58 grasshoppers in an average meal, while in October 2.27 grasshoppers are taken. Attention is directed to the facts that, ordinarily, grasshoppers have done the greatest amount of damage of which they are capable by September 15 and they also have laid most of their eggs by this time. Consequently, the grasshoppers that are eaten after September 15 are of little economic importance. If pheasants are to exert an important influence in keeping down the number of grasshoppers, the birds should feed heavily upon grasshoppers during May, June, July and August. However, during these months each average pheasant ate only 0, 0.09, 0.94 and 1.5 grasshoppers per meal.

The investigation covered by this report was conducted during a year when grasshoppers were more abundant in South Dakota than usual, but in no section of the State were they sufficiently numerous to cause any extensive damage to crops. In spite of the fact that the grasshoppers were abundant, an average pheasant ate slightly less than 1.5 grasshoppers per meal and this includes the dead hoppers picked up during the cold months of the year. The conclusion must follow that the pheasant is not a heavy consumer of grasshoppers, even when locusts are abundant. This same opinion is held by Swenk (10) who investigated the food habits of the pheasant in Nebraska, and by Maxson (3) who studied the food eaten by pheasants in Colorado.

At least 17 species of grasshoppers were found in the food tubes of our pheasants. In South Dakota we have four species of grasshoppers which are outstanding for the large amount of injury which they do to farm and garden crops. While these four species were abundant during the course of this investigation, they were found in unexpectedly small numbers in the crops and gizzards of our pheasants, as the following figures indicate.

two-striped grasshopper	- -	18	specimens	in	crops	and gizzards
differential "	- -	19	"	"	"	" "
red-legged "	-	232	"	"	"	" "
lesser migratory "	- -	15	"	"	"	" "

That the pheasant exercises but little influence in preventing or reducing an outbreak of grasshoppers is borne out thru the fact that severe outbreaks of grasshoppers occurred in areas of the State during 1931, 1932 and 1933 where the pheasants were abundant, or fairly so.

Only one of our pheasants fed upon grasshopper eggs and, therefore, we must conclude that such feeding is unusual under conditions such as existed when this investigation was being conducted.

Only three species of crickets were eaten by the pheasants that we examined, namely, 97 specimens of the black field cricket by 26 birds, 122 specimens of the striped ground or Nemobius cricket by 3 birds, and 11 specimens of the black-horned cricket by 8 birds. The average numbers of each of these crickets taken per meal per bird were 0.273, 0.386 and 0.032 respectively. Pheasant number 327 contained 3 black field crickets and 112 striped ground crickets in its crop and 8 striped ground crickets in its gizzard. An occasional pheasant, therefore, may eat quite a large number of crickets at a meal, but evidently these insects do not constitute a large item in the food of the average pheasant.

Coleoptera or beetles were taken in considerable numbers by our pheasants, for 541 entire or nearly entire specimens were found in the crops and gizzards of the birds. These specimens represented at least 13 families. Considered from an economic aspect, only 11 specimens or approximately two per cent of the total eaten, were useful to man, 191 or about 35 per cent were harmful, 317 or approximately 59 per cent were neutral in character, while 21 or about four per cent were assigned a doubtful status. The ground beetles or Carabidae were taken in largest quantity and then follow the leaf-beetles or Chrysomelidae, the snout-beetles or Curculionidae, the lamellicorn beetles or Scarabaeidae, and the click beetles or Elateridae.

Some of the most harmful beetles eaten by our pheasants were the seed corn beetles, the 12-spotted cucumber beetle, the striped cucumber beetle, the three-lined potato beetle, two varieties of the parents of the strawberry rootworm, the banded flea beetle, at least six species of click beetles which are the parents of the wireworms, a species of May beetles which are the parent of the white grub, and at least two species of darkling beetles which are the parents of the great plains wireworm. A large number of snout beetles were also eaten by our pheasants, but most of these were not identified to the species. Strange to say, not a single Colorado potato beetle was included in the food contents of our pheasants. Some of the useful beetles that were eaten by our pheasants were the parenthesis ladybird beetle, a species of checkered beetle, a species of tiger beetle and at least seven species of ground beetles.

After one studies the economic status of the beetles that are eaten by our pheasants during the course of a year, one must conclude that the birds do much more good than harm, so far as their beetle ration is concerned. Further, the beetles consumed are principally soil inhabiting or the beetles feed upon low growing plants.

Seven moths, two butterflies, two pupae and 296 caterpillars were included in the food found in the crops and gizzards of our pheasants. None of these specimens were considered useful to man, 279 specimens, or approximately 91 per cent of the total eaten, were regarded as harmful, six, or about two per cent, were given a neutral classification, while 22, or approximately seven per cent were regarded as having a questionable classification.

A total of 240 cutworms were found in the crops and gizzards of the pheasants examined. Of these, 131 cutworms were found in the crops, while 109 were taken from the gizzards. Cutworms were found in the crops of the pheasants during only five months of the year, the percentage of pheasants by months having cutworms in their crops and the average number of cutworms in their crops by months of the year were as follows:

	Feb.	Apr.	May	June	Nov.
Percentage of pheasants by months that contained cutworms in their crops	0.07	0.09	0.24	0.21	0.10
Average number of cutworms found by months in each crop	0.07	0.18	1.47	2.03	0.1

The average number of cutworms taken by our pheasants in an average meal for the year was 0.311. If we assume that a pheasant eats two such meals per day and every day during the year, then each pheasant will devour approximately 227 cutworms per year.

Bird number 60, shot in a cornfield in Beadle County, May 31, 1929 at 8 P.M., was remarkable because its crop contained 38 cutworms, while in the gizzard there were 25 cutworms and 16 mandibles of cutworms.

Before any definite conclusions can be drawn regarding the economic status of the pheasant in its relationship to cutworms, it is necessary that a thoro field study be made of the feeging activities of the pheasant and that during such studies it will be determined just how much damage, if any, the pheasants do when they seed for and devour cutworms under any and all circumstances.

A total of 392 Hymenoptera (ants, ichneumon flies, chalcid flies, sawflies and wasps) were found in the food tubes of the 285 pheasants used in this project. Approximately 97 per cent of these insects, or 379, were classed as harmful to man, one per cent, or five, were useful and approximately two per cent, or eight were given a questionable economic classification. Only a single bee was included in the Hymenoptera eaten by our pheasants, but 367 specimens of ants were taken. That so many ants were eaten is not surprising when one remembers that the pheasant obtains most of its food from the surface of the ground. Since so large a number of injurious Hymenoptera were eaten by our pheasants, one must conclude that the pheasants do more good than harm when Hymenoptera are consumed.

Only 71 whole or nearly whole bugs were found in the food tubes of the 285 pheasants used in this investigation. Twenty-six of these bugs or approximately 37 per cent were classed as injurious to man, 7 or approximately 10 per cent were useful to man, 27 bugs or approximately 38 per cent were neutral and 11 or approximately 15 per cent were given a questionable economic classification. The most harmful bugs listed in the food of our pheasants were false chinch-bugs, buffalo tree-hoppers, aphids or plant lice and leaf bugs. However, since such a small number of harmful bugs were eaten by our pheasants, it must be concluded that the pheasants are a negligible factor in keeping in check our harmful Hemiptera and Homoptera. Further, since only

71 bugs all told were found in the food tubes of our birds, the conclusion must be drawn that bugs in general are a small item in the food of the pheasant.

Only 9 specimens of lacewing flies were found in the food tubes of our pheasants. Fortunately, only a small number of these beneficial insects were taken by the pheasants and, therefore, the harm done was negligible.

Spiders do not constitute an important food item in the total food consumed by our pheasants, for only 30 of our 285 pheasants had spiders in their crops or gizzards, and these birds had taken a total of only 68 spiders.

Millipedes of several species were found in the food tubes of our pheasants but since a total of only 15 millipedes were taken by the pheasants and only 10 pheasants had fed upon these millipedes, it must be concluded that millipedes are an unimportant factor in the food of pheasants.

A total of only 13 snails were used as food by five of our pheasants and, therefore, snails must be regarded as a negligible item of food of pheasants.

While the pheasant population consumes an immense number of insects each year, there is no evidence that these birds act as an important check upon the rapid increase in number of any species of insect.

Only 33 of the crops, but all of the gizzards, of our pheasants contained stones. These stones consisted principally of small quartz pebbles, tho a small amount of calcareous matter was occasionally included. Only two crops contained stones plus a small amount of finely divided soil. In both the crops and gizzards the stones varied considerably in number, in size and in total volume. For the entire year, each average gizzard contained 266.9 stones and these totaled 3 cc. in volume.

Year in and year out the pheasant probably does as much good as harm thru its feeding habits in South Dakota. However, the pheasant may become harmful locally, but this is probably due to an overabundance of birds in this area, proximity to good cover and desirable breeding areas, scarcity or absence of water and an abundance of desirable food in the form of crops, either truck or field. Since the bird tends to feed heavily on palatable and readily available foods, and since many of our farm and truck crops meet these requirements, the capacity of the pheasant for doing considerable harm (other conditions favoring this) must be recognized. It is conceivable that some pheasants representing a small

proportion of the total may take on habits that are destructive to farm crops, but if this is true, the solution does not necessarily lie in condemnation and destruction of the entire pheasant population. It is undoubtedly true that it would not be advisable to permit the pheasant population to increase unrestrictedly. This fundamental fact is recognized by the State Game and Fish Department and, therefore, we have an opened or closed hunting season on pheasants with variable bag limits to suit conditions.

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